THE LYNX SPIDER GENUS *HAMATALIWA* IN MEXICO AND CENTRAL AMERICA (ARANEAE: OXYOPIDAE)

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ABSTRACT

Spiders of the genus *Hamataliwa* in Mexico and Central America are described and illustrated. A new definition of *Hamataliwa* includes eight species originally assigned to *Oxyopeidon* and seven species originally assigned to *Oxyopes*. Four species of *Hamataliwa* from Mexico and Central America are retained in the genus and five species are described as new. In short, 24 species of *Hamataliwa* are recorded from Mexico and Central America, where previously only four were reported. The genus *Hamataliwa*, undoubtedly, will prove to be as widespread as *Oxyopes* when additional studies in tropical regions are completed.

Three species groups of *Hamataliwa* have been established on the basis of positive correlation between eye arrangement and the structure of the palpus and/or epigynum. The *banksi* group consists of seven species, the *puta* group consists of eight species, and the *grisea* group consists of three species. On the basis of present information no clearly defined relationship could be established for the remaining six species of *Hamataliwa*.

Although distribution data are scarce, records and maps are given for those specimens examined. Much more work needs to be done in Mexico and Central America to provide a clear picture of species ranges. In general, intraspecific populations of oxyopids in this region tend to be much more variable than comparable groups from North America, north of Mexico.

INTRODUCTION

This paper is an outgrowth of an earlier work on the Oxyopidae of North America, north of Mexico (Brady, 1964). In that investigation 17 species of oxyopids representing three genera were recorded and described from North America. For that study, I examined numerous specimens of Neotropical oxyopids to determine the geographic range of the North American species. I uncovered problems of inadequate descriptions and figures, as well as numerous errors in systematic placement. The present study is primarily an effort to correct this situation and to establish a foundation on which future investigations might be based. The collections examined from Mexico and Central America were not extensive, and although collecting has been concentrated only in certain areas of this region (for example, Barro Colorado Island), I judged the amount of material adequate. Because the number of oxyopid species increases considerably as one moves southward into Mexico and Central America, it seemed advisable to report on the genera in this area individually rather than to treat the entire family in one monograph. This paper is the first in a series I plan on the Neotropical oxyopids. In addition to shedding some light on the

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evolutionary relationships of the species involved, I hope that this study will provide pertinent information about the distributional patterns of spiders in the Neotropical Region.

In the present investigation, I cover eight species found in Mexico and Central America that were originally described in the literature as *Oxyopeidon*. In addition, I have placed in *Hamataliwa* seven species originally assigned to *Oxyopes* and recorded from that region. These changes are based on an intensive study that necessitated a redefinition of *Hamataliwa* (Brady, 1964). This new diagnosis indicated both that *Oxyopeidon* was a synonym of *Hamataliwa* and that certain species placed in *Oxyopes* were much closer to *Hamataliwa* than investigators previously thought. Four species of *Hamataliwa* from Mexico and Central America remain in the genus, and five species are newly described in this paper. It is likely that numerous species of *Oxyopes* and the remaining species described in the literature under *Oxyopeidon* belong in *Hamataliwa* as characterized here. After additional studies are completed, the genus *Hamataliwa* will undoubtedly prove to be as widespread as *Oxyopes*. For example, in a recent work on spiders from south New Guinea, Father Chrysanthus (1967) figures *Oxyopes tapponiformis* Strand. The figures, as well as measurements provided by the author, indicate that this species belongs in *Hamataliwa*.

The revision of *Hamataliwa* as it is treated here is based primarily on morphological evidence. Although my approach to delimiting species is based on morphological distinctness, I have considered carefully other factors, such as ecological amplitude and individual variation demonstrated in field investigations of the North American species. I have used *Hamataliwa grisea* and *H. helia*, two of the more closely studied American representatives of this group, as "standards" for testing assumptions and for drawing conclusions about reproductive isolation. My preliminary studies of the behavior of these two species in the field and their natural history have been reported elsewhere (Brady, 1964). I have considered other factors which I do not yet fully understand. For example, it appears that members of a single population of the same species in Mexico and Central America tend to vary more than their North American counterparts. Perhaps this is a result of the increased interspecific competition among tropical populations, or it may simply be a consequence of local diversity in the physical environment. This intraspecific variation must, however, be considered in judging the significance of differences in allopatric populations.

In this day of molecular analysis and comparative behavioral studies, the value of a strict morphological approach to systematic problems may be questioned, but one must lay a foundation at some point. The time necessary to gather information to establish this base is a primary question. How long would it take to acquire enough ecological, behavioral, or molecular data so that one would have sufficient evidence to modify the conclusions drawn from morphology? For the Neotropical Oxyopidae, it would take months and perhaps years. I wish to make clear that I am not arguing against the acquisition of additional information from ecological, behavioral, and molecular studies, nor am I questioning the value of data from these areas. I hope that this paper might stimulate further investigations in ecology, behavior, and molecular analysis. I am emphasizing the need for presenting basic morphological revisions where adequate numbers of specimens are available and qualified systematists are present. I feel that morphological studies cognizant of the factors mentioned above provide an adequate basis for establishing genetic relationships and that such studies provide a firm foundation on which to build future interpretations of phylogeny. Because this

morphological study modifies considerably the findings of earlier authors, and because it clears up some difficult nomenclatural problems and consolidates scattered bits of information, I felt that it should be presented without further delay.

ACKNOWLEDGMENTS

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I wish to thank Dr. G. Owen Evans and Mr. Douglas Clark, whose hospitality I enjoyed for three weeks in the summer of 1963 at the British Museum (Natural History). A grant from the Evolutionary Biology Committee, Biological Laboratories, Harvard University, made this visit possible. Type specimens of O.P.- and F.O.P.-Cambridge were drawn and examined at that time. As my investigation progressed, I realized that critical measurements and additional drawings would be necessary to diagnose properly certain of the Cambridges' types. I appreciate the further courtesy of Dr. Evans and Mr. Clark for making this possible.

I would also like to thank Dr. O. Kraus of the Senckenberg Museum, Frankfurt, and Dr. E. Kritscher of the Natural History Museum, Vienna, for making available critical type specimens. Father Chrysanthus aided by checking the proper Latin endings for many of the specific names.

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METHODS

The methods for measuring specimens during this study were essentially the same as those I employed in my earlier paper on the family Oxyopidae (Brady, 1964). The color descriptions and illustrations are based on alcoholic specimens that were in reasonably good condition (except where noted to the contrary).

Locality records are listed geographically in a sequence from north to south and from east to west. The number of specimens collected at each locality is indicated; the lower case "o" represents immature specimens.

For most species, the face view as well as the dorsal view of a male and female were drawn (when both were available). A ventral external view of the epigynum (after all of the hair had been removed) was drawn. This drawing often reveals some internal structures through the integument. In addition, a dorsal internal view with the genitalia separated from the spider and submerged in clove oil was figured. The female genitalia of all species are drawn to the same scale. The scales are indicated on the plates. Two views, a ventral and a lateral, were drawn for each species. These were drawn after the palpus had been gently scraped free of hair to reveal as clearly as possible the palpal sclerites and patellar or tibial apophyses. No attempt was made to indicate spination or hairiness in the drawings. All palpi are drawn to the same scale.

SCIENTIFIC NAMES OF UNCERTAIN STATUS

R. V. Chamberlin (1924) described one new species and one new subspecies of *Oxyopeidon* from the shores and islands

of the Gulf of California. Immature specimens of *Oxyopeidon absolutum* were collected from San Esteban Island, Concepcion Bay, Puerto Escondido, Angel de la Guarda Island, and San Josef Island. There are no distinguishing characteristics that differentiate these specimens from immature *Hamataliwa grisea*. A geographic race, *Oxyopeidon absolutum obliquum* was described from Coronados Island because of different coloration than other specimens of *O. absolutum*. The holotype is an early instar of *Hamataliwa*. *Hamataliwa grisea* varies considerably in coloration, as do other species of *Hamataliwa*, and coloration alone does not warrant subspecific recognition. Until mature specimens are collected from the above localities along the shore and on islands of the Gulf of California, it seems best to consider *Oxyopeidon absolutum* as a synonym of *Hamataliwa grisea*.

Reimoser (1939) described two new species of *Hamataliwa* from San José, Costa Rica. One of these, *H. schmidti*, is newly described and figured in this study. The other species, *H. tristani*, is based on two female specimens supposedly deposited in the Natural History Museum, Vienna. These two specimens were unavailable for study, and the original description and Reimoser's sketch are not sufficient to provide an accurate determination of *H. tristani*.

Hamataliwa Keyserling

Hamataliwa Keyserling, 1887, Verh. Zool.-Bot. Ges. Wien, 6:458, fig. 24, ♀. Type species by monotypy: *Hamataliwa grisea* Keyserling, op. cit., 6:458, fig. 24, ♀, from North America in British Museum (Natural History), examined.

Oxyopeidon O. P.-Cambridge, 1894, Biologia Centrali-Americana, Arachnida, Araneidea, 1: 139. Type species designated by F.O.P.-Cambridge, 1902, Biologia Centrali-Americana, Arachnida, Araneidea, 2:346: *Oxyopeidon putum* O.P.-Cambridge, 1894, *op. cit.*, 1:140, in British Museum (Natural History), examined.

Characteristics. For general characteristics of the genus refer to Brady (1964), p. 496.

Diagnosis. In *Hamataliwa* the eye rows differ in position and/or proportional width from those of *Oxyopes*. The face is often not vertical as it is in other oxyopids, but slopes more gradually toward the clypeus. In many species of *Hamataliwa*, the carapace is clothed with long hair, often with tufts in the eye region. In addition, there may be long hairs on the lateral surfaces of the legs and along the sides of the abdomen. These features add to the cryptic effect offered by their coloration and provide concealment against bark of trees and twigs or against woody shrubs. Many species are undoubtedly arboreal in habit. *Hamataliwa* seems to be as well defined ecologically as it is morphologically.

Leg development and structure appear to be correlated with arboreal habits. In all species studied, except *H. tricuspidata*, the relative leg length is I-II-III-IV. The first two pairs of legs are long and robust, the third and fourth pairs weakly developed. In *Oxyopes* the fourth pair of legs is strongly developed concomitant with their jumping habits. Observed species of *Hamataliwa* are more sedentary than *Oxyopes*.

The general form of the epigyna in *Hamataliwa* is a semi-circular or U-shaped, heavily sclerotized rim surrounding a shallow median depression with a characteristic shape in each species. Male palpi are also similar in basic construction, with the embolus following a definite route and forming a characteristic twist or loop near the base at the mesal edge of the cymbium.

The above combination of characteristics distinguish members of *Hamataliwa* from *Oxyopes*.

SPECIES GROUPS OF *HAMATALIWA*

Mexican and Central American species of *Hamataliwa* can be separated into several groups based on the comparative width of the eye rows and the position of certain eyes relative to others. I made comparisons of the structure of the geni-

talia, bodily proportions, and coloration of those species that have similarities in eye arrangement. Most species of *Hamataliwa* can be placed in species groups based on a positive correlation between eye arrangement and the structure of the palpus or epigynum. Color patterns and bodily proportions are also useful, but they are not as reliable in preserved specimens. Although the species groups thus established may not be strictly natural assemblages, they do include species that have certain common characteristics and are apparently related. A few species are arbitrarily included in a particular species group because of a similarity in eye arrangement. In these cases we know only one sex; the discovery of the other sex will determine whether or not the placement is valid.

Banksi group. In the *banksi* group (*banksi, helia, brunnea, triangularis, barroana, globosa* and *cheta*) the ALE row is wider than or subequal to the PME row. *Hamataliwa banksi, H. helia, H. brunnea,* and *H. triangularis* have the ALE row wider than the PME row. Of these four species, *H. banksi* and *H. helia* are very closely related (see discussion under *H. banksi*). *Hamataliwa brunnea* agrees closely with *H. banksi* and *H. helia* in eye arrangement (compare Fig. 39 with Fig. 3), but the epigynum of *H. brunnea* is different (compare Fig. 59 with Figs. 54–58). Although the epigynum of *H. triangularis* is quite distinct from that of other members of this group, the eye arrangement resembles that of *H. banksi* and the palpus of the male bears a close resemblance to that of *H. helia* (compare Figs. 120, 121 of this paper with figs. 130–133 of Brady, 1964).

Hamataliwa barroana, H. globosa, and *H. cheta* have the ALE row subequal to the PME, i.e. the PME row is less than .05 mm wider than the ALE. This eye arrangement is much nearer to that of members of the *banksi* group than to that of other species of *Hamataliwa.*

The epigynum and internal genitalia in *H. barroana* bear a strong resemblance to those of *H. banksi* (compare Figs. 60–62 with Figs. 54–58). *Hamataliwa cheta* has an epigynum similar to that of *H. barroana. Hamataliwa globosa* is included in this group because of the eye arrangement. The palpus of *H. globosa* (Figs. 122–123) distinguishes it from all other species of *Hamataliwa.*

Puta group. In the *puta* group (*puta, ursa, cavata, hista, flebilis, difficilis, laeta, crocata*), the PME row is much wider than the ALE row. These species have the PME much closer to the PLE than do the members of the *banksi* species group.

The male palpi also strongly resemble one another (see Figs. 107–118). *Hamataliwa puta, H. ursa,* and *H. cavata* have very similar epigyna (compare Figs. 65–67, with Figs. 68, 69 and Figs. 73, 74). These three species may prove to be geographic races after more data on their biology and distribution is collected. On the basis of present materials and information, however, they appear to be morphologically distinct species. In *H. puta* and *H. ursa,* the male palpi easily separate the two species (compare Figs. 113–119 with Figs. 111–112). The seminal receptacles of *H. cavata* are considerably more elongate than those in *H. puta* or *H. ursa* (compare Fig. 73 with 65, 68).

Hamataliwa flebilis and *H. laeta* have epigyna resembling those of *H. banksi,* but these may also be associated with *H. puta.* The male palpus of *H. flebilis* is similar to that of other males in the *puta* group (compare Figs. 124, 125 with Figs. 107–119). Because of this similarity and because of the correspondence in eye arrangement, *H. flebilis* and *H. laeta* are included in the *puta* group.

Hamataliwa hista has an epigynum readily distinguished from that in all other species of *Hamataliwa;* however, the male palpus bears a strong resemblance to that in other members of the *puta* species

group. (compare Figs. 107–108 with Figs. 109–119).

Hamataliwa difficilis and *H. crocata* are placed in the *puta* group primarily because of eye arrangement. Although their epigyna are distinct, they may arbitrarily be considered as similar to those of the *puta* complex. When the male of *H. difficilis* is known, it will be easier to place this species. *Hamataliwa crocata* has a distinct male palpus (Figs. 126, 127) and is the most divergent members of this species group.

Grisea group. The epigyna and internal genitalia of *H. grisea, H. facilis,* and *H. schmidti* bear a strong resemblance to one another. The eye relationships in this species group are not as uniform as are those in the previous two species groups, but the structure of the cephalothorax and the general arrangement of the eyes, together with the genitalic similarities, support their amalgamation into a separate complex. Discovery of the males in *H. facilis* and *H. schmidti* will clarify the situation.

Of the remaining six species, *H. positiva* and *H. unca* have eye arrangements and epigyna that closely resemble one another, thus indicating kinship, but they could not be linked with other species. *Hamataliwa positiva* has an epigynum resembling that in certain specimens of *H. facilis* (compare Fig. 93 with Figs. 97, 98); however, the eye arrangements in the two species are completely different (compare Fig. 43 with Fig. 44). *Hamataliwa circularis* and *H. subfacilis* have eye dispositions reminiscent of those in members of the *puta* species group, but they do not agree in proportion. The bodily structure and epigynum of *H. circularis* (Figs. 37, 38, 99, 100) and the eye arrangement and epigynum of *H. subfacilis* (Figs. 45, 92) make it difficult to relate them to any group.

The general body structure, profuse hair, and structure of the epigynum of *H. bufo,* as well as the absence of the male, exclude it from any of the above groups.

Hamataliwa tricuspidata is distinct from all species of *Hamataliwa* thus far studied. The order of leg length is I-II-IV-III, and coloration and eye arrangement resemble those in certain species of *Oxyopes,* but the epigynum and palpi, together with the proportions of the legs, are akin to those in *Hamataliwa* (see discussion under *H. tricuspidata*).

KEY TO SPECIES OF *HAMATALIWA*

MALES

1a. ALE row wider than or subequal* to PME row 2
1b. PME row distinctly wider than ALE row 5
2a. Cymbium of palpus almost as wide as long, ALE row subequal to PME. Color pattern and eye arrangement as in Figs. 11, 12. Palpus as in Figs. 122, 123 ..... *globosa*
2b. Cymbium of palpus much longer than wide, ALE row slightly wider than PME 3
3a. Distinct color pattern and eye arrangement as in Figs. 52, 53. Palpus as in Figs. 128, 129 ..... *tricuspidata*
3b. Color pattern not as in 3a. Palpus not resembling those in Figs. 128, 129 4
4a. Palpus illustrated in Figs. 120, 121. Color pattern and eye arrangement as in Figs. 9, 10 ..... *triangularis*
4b. Palpus illustrated in Figs. 130–133. Color pattern and eye arrangement as in figs. 124, 125 (Brady, 1964) ..... *helia*
5a. Palpus with two large tibial apophyses as in Figs. 126, 127. Color pattern and eye arrangement as in Figs. 35, 36 ..... *crocata*
5b. Palpus with only a single tibial apophysis or a lateral apophysis with a large tooth or spur at its base 6
6a. Palpus with a single lateral apophysis without a tooth or spur at its base 7
6b. Palpus with a single lateral apophysis with a conspicuous tooth or spur at its base as in Figs. 107–119 8
7a. Palpus illustrated in Figs. 124, 125. Color pattern and eye arrangement as in Figs. 25, 26 ..... *flebilis*
7b. Palpus illustrated in Figs. 128, 129. Color pattern and eye arrangement as in figs. 122, 123 (Brady, 1964) ..... *unca*
7c. Palpus illustrated in Figs. 134, 135.

* PME row less than .05 mm wider than ALE row.

Color pattern as in figs. 126, 127 (Brady, 1964) ..... *grisea*

8a. Palpus illustrated in Figs. 107, 108. Color pattern and eye arrangement as in Figs. 27, 28 ..... *hista*

8b. Palpus illustrated in Figs. 109, 110. Color pattern and eye arrangement as in Figs. 29, 30 ..... *cavata*

8c. Palpus illustrated in Figs. 111, 112. Color pattern and eye arrangement as in Figs. 31, 32 ..... *ursa*

8d. Palpus illustrated in Figs. 113–119. Color pattern and eye arrangement as in Figs. 33, 34 ..... *puta*

KEY TO SPECIES OF *HAMATALIWA*

FEMALES

1a. ALE row wider than or subequal* to PME row 2

1b. PME row distinctly wider than ALE row 6

2a. Patella-tibia IV slightly longer than patella-tibia III. Distinctive contrasting color pattern as illustrated in Figs. 50, 51. Epigynum and internal genitalia as in Figs. 104–106. ..... *tricuspidata*

2b. Patella-tibia III slightly longer than patella-tibia IV. Color pattern not as in 2a 3

3a. ALE row subequal to PME row, AME touching a line drawn tangent to lower edge of ALE, and AME less than own diameter from ALE on same side 4

3b. ALE row slightly but distinctly wider than PME row, AME well below a line drawn tangent to lower edge of ALE, and AME at least its own diameter from ALE on same side 5

4a. Epigynum and internal genitalia as in Figs. 60–62. Color pattern and eye arrangement as in Figs. 5, 6 ..... *barroana*

4b. Epigynum and internal genitalia as in Figs. 63, 64. Color pattern and eye arrangement as in Figs. 1, 2 ..... *cheta*

5a. Epigynum as in Fig. 59. Face view as in Fig. 39 ..... *brunnea*

5b. Epigynum and internal genitalia as in Figs. 54–58. Color pattern and eye arrangement as in Figs. 3, 4 ..... *banksi*

5c. Epigynum and internal genitalia as in Figs. 119, 120. Color pattern and eye arrangement as in figs. 112–114 (Brady, 1964) ..... *helia*

5d. Epigynum and internal genitalia as in Figs. 81–84. Color pattern and eye arrangement as in Figs. 7, 8 ..... *triangularis*

6a. Line drawn tangent to lower edge of ALE running above AME row. Epigynum and internal genitalia as in Figs. 101–103. Color pattern as in Figs. 48, 49 ..... *bufo*

6b. Line drawn tangent to lower edge of ALE running below AME, running through AME, or tangent to the upper edge 7

7a. Line drawn tangent to lower edge of ALE running below center of AME 8

7b. Line drawn tangent to lower edge of ALE, tangent to upper edge of AME, or running above center of AME 9

8a. Face view as in Fig. 44. Epigynum and internal genitalia as in Figs. 94–98 ..... *facilis*

8b. Epigynum as in Figs. 89–91. Color pattern and eye arrangement as in Figs. 46, 47 ..... *schmidti*

8c. Epigynum as in Figs. 115, 116. Color pattern as in figs. 108, 109 (Brady, 1964) ..... *grisea*

9a. AME more than own diameter from ALE 10

9b. AME own diameter or less from ALE 11

10a. Face view as in Fig. 43. Epigynum as in Fig. 93 ..... *positiva*

10b. Epigynum and internal genitalia as in Figs. 77, 78. Color pattern and eye arrangement as in Figs. 23, 24 ..... *crocata*

10c. Epigynum and internal genitalia as in Figs. 73, 74. Color pattern and eye arrangement as in Figs. 17, 18 ..... *cavata*

11a. Posterior sclerotized rim of epigynum more or less U-shaped 15

11b. Posterior sclerotized rim of epigynum V-shaped, scalloped, or straight 12

12a. Posterior rim of epigynum scalloped or V-shaped 13

12b. Posterior rim of epigynum straight, median depression rectangular 14

13a. Posterior rim of epigynum scalloped as in Fig. 92. Face view as in Fig. 45 ..... *subfacilis*

13b. Posterior rim of epigynum V-shaped as in Figs. 70–72. Color pattern and eye arrangement as in Figs. 13, 14. ..... *flebilis*

14a. Epigynum and internal genitalia as in Figs. 85–88. Face view as in Figs. 40, 41 ..... *difficilis*

14b. Epigynum and internal genitalia as in Figs. 117, 118. Color pattern and eye arrangement as in figs. 110, 111 (Brady, 1964) ..... *unca*

15a. Posterior rim of epigynum broadly U-shaped, almost circular; seminal receptacles widely separated as in Figs. 99–100. Color pattern and eye arrangement as in Figs. 37, 38 ..... *circularis*

* PME row less than .05 mm larger than ALE.

MAP 1

15b. Posterior rim U-shaped, seminal receptacles close together as in Figs. 65–72 16
16a. Epigynum and internal genitalia as in Figs. 65–67. Color pattern and eye arrangement as in Figs. 21, 22. ..... *puta*
16b. Epigynum and internal genitalia as in Figs. 68, 69. Color pattern and eye arrangement as in Figs. 19, 20 ..... *ursa*
16c. Epigynum and internal genitalia as in Figs. 73, 74. Color pattern and eye arrangement as in Figs. 17, 18 ..... *cavata*
16d. Epigynum and internal genitalia as in Figs. 75, 76. Color pattern and eye arrangement as in Figs. 15, 16 ..... *hista*

SPECIES DESCRIPTIONS

Hamataliwa banksi (Mello-Leitão)

Figures 3, 4, 54–58. Map 1.

Oxyopes brevis Banks, 1898, Proc. California Acad. Sci., 1(7):278, pl. 17, fig. 26, ♀. Female lectotype, here designated, from Cerro del Taste, Territorio Sur, Baja California, in Museum of Comparative Zoology, examined. Name preoccupied, not *Oxyopes brevis* Thorell, 1881.

Oxyopes annulipes F.O.P-Cambridge, 1902, Biologia Centrali-Americana, Arachnida, Araneidea 2:345, pl. 32, fig. 27, ♀. Female holotype from Amula, 9.5 km NW of Chilapa, Guerrero, Mexico, in the British Museum (Natural History), examined. Name preoccupied, not *Oxyopes annulipes* Thorell, 1892. NEW SYNONYMY.

Oxyopes banksi Mello-Leitão, 1928, Bol. Mus. Rio de Janeiro, 4(3):50. New name for *Oxyopes brevis* Banks.

Oxyopes cambridgei Mello-Leitão, 1928, Bol. Mus. Rio de Janeiro 4(3):50. New name for *Oxyopes annulipes* F.O.P.-Cambridge. NEW SYNONYMY.

Discussion. Coincidentally, the names *Oxyopes brevis* and *Oxyopes annulipes*, applied to this species by Banks and F.O.P.-Cambridge respectively, were both preoccupied. Mello-Leitão (1928) noticed this and gave new names to the species. The two names are considered synonymous in this paper because only one species is involved (compare Figs. 54–57 with Fig. 58).

Measurements. Length of eight females 4.1–5.1 mm, mean 4.84 mm; carapace width 1.4–2.0 mm, mean 1.76 mm; carapace length 1.7–2.5 mm, mean 2.16 mm.

Width of eye rows: AME .25–.30 mm, mean .272 mm; ALE .50–.68 mm, mean .631 mm; PLE .88–1.13 mm, mean 1.025 mm; PME .45–.63 mm, mean .547 mm.

Segments of leg I (five females): femur 1.9–2.4 mm, mean 2.18 mm; patella-tibia 2.0–2.7 mm, mean 2.43 mm; metatarsus 1.4–1.6 mm, mean 1.51 mm; tarsus .8–.9 mm, mean .82 mm; total length I 5.9–7.5 mm, mean 6.94 mm.

Length of patella-tibiae: II 1.9–2.5 mm, mean 2.23 mm; III 1.4–1.9 mm, mean 1.72 mm; IV 1.3–1.9 mm, mean 1.59 mm.

Color. Female. Pattern illustrated in Figures 3 and 4. Face pale yellow to light orange, chelicerae with slightly darker orange tint. Lighter, inversely T-shaped mark from AME row to lower edge of clypeus. Flattened white hairs, heaviest in eye region and along sides of face.

Carapace pale orange to orange, with scattered spatulate-shaped white hairs, most abundant along sides and at posterior declivity.

Dorsum of abdomen cream. Venter pale yellow to cream without distinct median stripe.

Legs pale yellow to light orange, somewhat darker distally.

Labium, endites, and sternum pale yellow to light orange.

Diagnosis. Hamataliwa banksi is very close to *H. helia* in body dimensions, eye arrangement, and the shape of the epigynum. These two species apparently overlap in distribution.

Hamataliwa banksi is larger than *H. helia*, and the females can be distinguished by epigynal structure. In *H. helia* the posterior rim of the epigynum is not as heavily sclerotized, and the central depression of the epigynum is larger and more oval than it is in *H. banksi* (compare figs. 119–120 of Brady, 1964, with Figs. 54–58 of this paper).

Separation of these two species may become impossible after larger series of specimens are collected. Until males of *H. banksi* are found and are compared with *H. helia* males, it seems best to maintain them as separate species.

Distribution. Mexico and Central America (Map 1).

Records. MEXICO. *Baja California.* Territorio Sur, Cerro del Taste, ♀♀. *Guerrero.* Amula, 9.5 km NW of Chilapa, (H. H. Smith).

GUATEMALA. Cobán, July 1947, ♀ (C., P. Vaurie).

COSTA RICA. San José, ♀♀ (E. Schmidt).

Hamataliwa helia (Chamberlin)

Oxyopes helius Chamberlin, 1929, Ent. News, 40:19, fig. 4, ♀. Female holotype from Mixson's Hammock, Okefenokee Swamp, Georgia, in the American Museum of Natural History, examined.

Hamataliwa helia is closely related to *H. banksi* and may be synonymous with that species (see discussion under *H. banksi*).

For illustrations of the color patterns and genitalia and locality records, refer to Brady (1964, p. 497).

Distribution. Florida to Texas and south to Yucatan.

Hamataliwa brunnea (F.O.P.-Cambridge)

Figures 39, 59. Map 1.

Oxyopes brunneus F.O.P.-Cambridge, 1902, Biologia Centrali-Americana, Arachnida, Araneidea, 2:346, pl. 32, fig. 29, ♀. Female holotype from Atoyac, Veracruz, Mexico, in the British Museum (Natural History), examined.

Discussion. This species is represented by the unique female above. Specimens designated as *Oxyopes brunneus* F.O.P.-Cambridge in other collections did not agree specifically with this one. The holotype was in such poor condition that the original color description is used below and only partial measurements were possible. Drawings of the epigynum and face were made.

Measurements. Length of female holotype 6.2 mm, carapace width 2.0 mm, carapace length 2.5 mm.

Width of eye rows: AME .28 mm, ALE .69 mm, PLE 1.22 mm, PME .62 mm.

Segments of leg I: femur 2.7 mm, patella-tibia 3.2 mm, metatarsus 1.9 mm, tarsus 1.0 mm, total length 8.8 mm.

Length of patella-tibiae: II 3.0 mm, III 2.0 mm, IV not present.

Color. Following is the original description of the holotype by F.O.P.-Cambridge: "The scales have been almost entirely rubbed off from the single specimen received of this species, and with these the colour and pattern have vanished; but the form of the vulva is quite distinct from that of any other *Oxyopes* in the collection before me. The general ground-colour is deep brown, whereas that of all the other members of the genus here described is yellow or orange."

Diagnosis. The structure of the epigynum in *H. brunnea* is similar to that of *H. crocata* (compare Fig. 59 with Fig. 78), but the eye arrangement in these two species is quite different (compare measurements). Body size and eye arrangement of *H. brunnea* ally it with *H. banksi.*

Record. MEXICO. *Veracruz.* Atoyac, ♀ (H. H. Smith).

Hamataliwa triangularis (Kraus)

Figures 7–10, 81–84. Map 1.

Oxyopes globosus F.O.P.-Cambridge, 1902, Biologia Centrali-Americana, Arachnida, Araneidea, 2:343 (in part), pl. 32, figs. 19, 19a ♀ only. Female allotype, from *Bugaba, Panama, in the British Museum (Natural History), examined. Not *Oxyopes globosus* F.O.P.-Cambridge ♂ holotype.

Oxyopoidon triangularis Kraus, 1955, Abh. Senckenb. Naturf. Ges., 493:38, pl. 5, fig. 97. Female holotype from San Salvador, El Salvador, in Senckenberg Museum, examined.

Discussion. The female described by F.O.P.-Cambridge as *Oxyopes globosus* does not agree in size or eye arrangement with the male holotype. In all species of *Hamataliwa* investigated the males are smaller than the females. The male holotype of *O. globosus* is larger than 20 females of *O. globosus* F.O.P.-Cambridge that were measured. In addition the ALE row of the male holotype is not wider than the PME row as in the female. Therefore, *H. triangularis* (Kraus) becomes the valid name for the female described as *Oxyopes globosus* F.O.P.-Cambridge.

Measurements. Length of two males 3.8, 4.2 mm, carapace width 1.5, 1.6 mm, carapace length 1.8, 1.9 mm.

Width of eye rows: AME .25, .27 mm, ALE .53, .55 mm, PLE .87, .93 mm, PME .50, .53 mm.

Segments of leg I: femur 2.0, 2.1 mm, patella-tibia 2.5, 2.8 mm, metatarsus 1.7, 1.9 mm, tarsus .9, 1.0 mm, total length 7.1, 7.8 mm.

Length of patella-tibiae: II 2.4, 2.5 mm, III 1.8, 1.9 mm, IV – –*, 1.6 mm.

Length of 10 females 4.2–5.3 mm, mean 4.90 mm; carapace width 1.6–1.9 mm, mean 1.78 mm; carapace length 2.0–2.3 mm, mean 2.4 mm.

Width of eye rows: AME .27–.30 mm, mean .281 mm; ALE .57–.63 mm, mean .606 mm; PLE .97–1.03 mm, mean 1.005 mm; PME .53–.60 mm, mean .569 mm.

Segments of leg I: femur 2.2–2.5 mm, mean 2.40 mm; patella-tibia 2.7–3.0 mm, mean 2.85 mm; metatarsus 1.8–2.0 mm, mean 1.92 mm; tarsus .8–1.0 mm, mean .91; total length 7.7–8.4 mm, mean 8.08 mm.

Length of patella-tibiae: II 2.5–2.8 mm, mean 2.68 mm; III 1.9–2.3 mm, mean 2.07; IV 1.6–1.9 mm, mean 1.78 mm.

Color. Male. Pattern illustrated in Figures 9 and 10. Face and chelicerae yellow-orange. Distal ends of chelicerae lighter, yellowish. Cymbia of palpi brown.

Carapace yellow-orange to orange.

Dorsum of abdomen cream colored. Sides darker, brownish. Venter of abdomen cream colored, slightly darker medially.

Legs yellow-orange without dusky markings.

Labium and endites ivory to pale cream. Sternum ivory.

Color. Female. Pattern illustrated in Figures 7 and 8. Face and chelicerae yellow to yellow-orange, with relatively thick clothing of white appressed hairs, thickest at lateral and ventral margins of face.

* Chiriquí, 22 km NW of David.

* Two dashes indicate a missing leg segment.

Carapace pale yellow to yellow-orange. Vertical sides with white or mixture of white and dark brown spatulate hairs.

Dorsum of abdomen cream colored, without darker markings or, in a few specimens, an irregular spotted pattern formed from an intermixture of white and dark brown hairs. Large dark brown spots along sides of abdomen about one-third of the distance from the spinnerets to the base in these hirsute specimens. Venter of abdomen cream colored.

Legs pale yellow to cream with dusky brown bands at distal ends of femora and tibiae, tibiae dusky at proximal ends as well. Dusky bands formed by spatulate-shaped hair.

Labium and endites pale yellow to yellow-orange. Sternum cream to pale yellow.

Diagnosis. *Hamataliwa triangularis* is similar to *H. banksi* and *H. brunnea* in eye arrangement. The palpus of the male resembles that of *H. helia* (compare Figs. 120–121 of this paper with figs. 130–133 of Brady, 1964). *Hamataliwa triangularis* can be readily differentiated from other members of this group of species by the structure of the epigynum (Figs. 81–84).

Distribution. El Salvador to Panama (Map 1).

Records. EL SALVADOR. San Salvador, 21 June 1951, 3♀♀ (A. Zilch).

PANAMA. *Canal Zone.* Barro Colorado Island, numerous ♂♂♀♀ (A. M. Chickering); Madden Dam, 8 Aug. 1939, ♀ (A. M. Chickering), 28 May 1956, ♀ (W. E. Lundy).

Hamataliwa barroana (Chamberlin and Ivie)

Figures 5, 6, 60–62. Map 1.

Oxyopes barroanus Chamberlin and Ivie, 1936, Bull. Univ. Utah, Biol. Ser., 3(5):18, pl. 4, fig. 27, ♀. Female holotype from Barro Colorado Island, Panama Canal Zone, in the American Museum of Natural History, examined.

Measurements. Length of 10 females 4.7–5.7 mm, mean 5.16 mm; carapace width 1.7–1.9 mm, mean 1.81 mm; carapace length 2.1–2.3 mm, mean 2.19 mm.

Width of eye rows: AME .25–.28 mm, mean .274 mm; ALE .68–.73 mm, mean .708 mm; PLE 1.17–1.25 mm, mean 1.211 mm; PME .68–.77 mm, mean .730 mm.

Segments of leg 1: femur 2.0–2.4 mm, mean 2.17 mm; patella-tibia 2.5–3.0 mm, mean 2.72 mm; metatarsus 1.5–1.9 mm, mean 1.74 mm; tarsus .8–.9 mm, mean .82 mm; total length I 6.8–8.0 mm, mean 7.44 mm.

Length of patella-tibiae: II 2.4–2.6 mm, mean 2.48 mm; III 1.8–2.0 mm, mean 1.88 mm; IV 1.7–1.9 mm, mean 1.81 mm.

Color. Female. Pattern illustrated in Figures 5 and 6. Face yellow-orange with broad light brown vertical stripes from ALE to lower edge of clypeus. Chelicerae yellow-orange, overlaid with brown. Hexagonal area bounded by eyes, reddish. Interior distal ends lighter in color.

Carapace yellow-orange. Dorsum of abdomen cream colored. Cardiac area translucent gray. Lateral areas with scattered spots of reddish hair. Venter of abdomen cream colored with broad light brown stripe from epigastric furrow to base of spinnerets.

Legs pale yellow to cream.

Labium pale orange-yellow. Endites pale orange-yellow, distal ends tipped with cream. Sternum cream.

Diagnosis. *Hamataliwa barroana* is readily distinguished from other species of *Hamataliwa* by the shape of the epigynum. (Figs. 60–62). In both *H. barroana* and *H. globosa,* the ALE row is subequal to the PME row. They may be related to the *H. banksi* group in which the ALE row is wider than the PME rows. In all other species of *Hamataliwa,* the PME row is much wider than the ALE row, with the exception of *H. tricuspidata.*

Distribution. Mexico and Central America.

Records. MEXICO. *Veracruz.* La Buena Ventura, July 1909, ♀. *Yucatan,* Colonia, 13–19 Aug. 1952, ♀ (J., D. Pallister).

PANAMA. *Canal Zone.* Barro Colorado Island, numerous ♀♀, various collectors;

Gamboa, 11 Aug. 1939, 4♀♀; Madden Dam, 18 Aug. 1936, 4♀♀ (A. M. Chickering).

Hamataliwa globosa (F.O.P.-Cambridge)

Figures 122, 123. Map 1.

Oxyopes globosus F.O.P.-Cambridge, 1902, Biologia Centrali-Americana, Arachnida, Araneidea, 2:343 (in part), pl. 32, figs. 18, 18a–c, ♂ only. Male holotype from Bugaba, Panama, in British Museum (Natural History), examined.

Discussion. The female described by F.O.P.-Cambridge as *Oxyopes globosus* belongs to the species described by Kraus (1955) as *Oxyopes triangularis*. For further comments see the discussion under *Hamataliwa triangularis*.

Measurements. Length of five males 4.7–5.5 mm, mean 4.92 mm; carapace width 1.8–1.9 mm, mean 1.85 mm; carapace length 2.1–2.4 mm, mean 2.18 mm.

Width of eye rows: AME .25–.28 mm, mean .264 mm; ALE .63–.72 mm, mean .668 mm; PLE 1.10–1.25 mm, mean 1.149 mm; PME .65–.75 mm, mean .685 mm.

Segments of leg I: femur 2.1–2.4 mm, mean 2.19 mm; patella-tibia 2.7–3.0 mm, mean 2.84 mm; metatarsus 1.9–2.0 mm, mean 1.91 mm; tarsus .9–1.0 mm, mean .92 mm; total length I 7.6–8.3 mm, mean 7.86 mm.

Length of patella-tibiae: II 2.4–2.7 mm, mean 2.57 mm; III 1.9–2.2 mm, mean 1.97 mm; IV 1.7–2.0 mm, mean 1.80 mm.

Color. Male. Pattern illustrated in Figures 11 and 12. Face yellow with broad vertical stripes of brown from ALE row to lower edge of clypeus. Chelicerae darker, brownish. Cymbia of pedipalpi dark brown.

Carapace light orange-yellow without darker markings or sometimes dusky along sides.

Dorsum of abdomen white to cream colored with brownish margins and sides. Often with a few scattered darker spatulate hairs about mid-point of abdomen. Venter of abdomen white to cream colored with or without median dusky band.

Legs yellow without darker markings.

Labium and endites yellow with distal ends lighter, ivory. Sternum ivory.

Diagnosis. Hamataliwa globosa is distinct from all other species of *Hamataliwa* on the basis of palpal structure (Figs. 122, 123). The fact that the cymbium of the palpus is almost as wide as it is long makes for easy recognition. The eye arrangement is nearest to that of *H. triangularis* and *H. barroana*.

Distribution. Mexico and Central America (Map 1).

Records. MEXICO. *San Luis Potosí.* Tamazunchale, 20 May 1952, ♂ (M. Cazier, W. Gertsch, R. Schrammel).

PANAMA. *Canal Zone.* Barro Colorado Island, 7–8 May 1946, 3♂♂ (T. C. Schneirla); Bugaba (Chiriquí, 22 km NW of David), ♂ (G. C. Champion).

Hamataliwa cheta sp. n.

Figures 1, 2, 63, 64. Map 1.

Holotype. Female from Cobán, Guatemala, July 1947 (C., P. Vaurie), in the American Museum of Natural History. The specific name is an arbitrary combination of letters.

Measurements. Length of three females 6.4, 6.9, 7.5 mm; carapace width 2.3, 2.3, 2.4 mm; carapace length 2.8, 2.8, 2.9 mm.

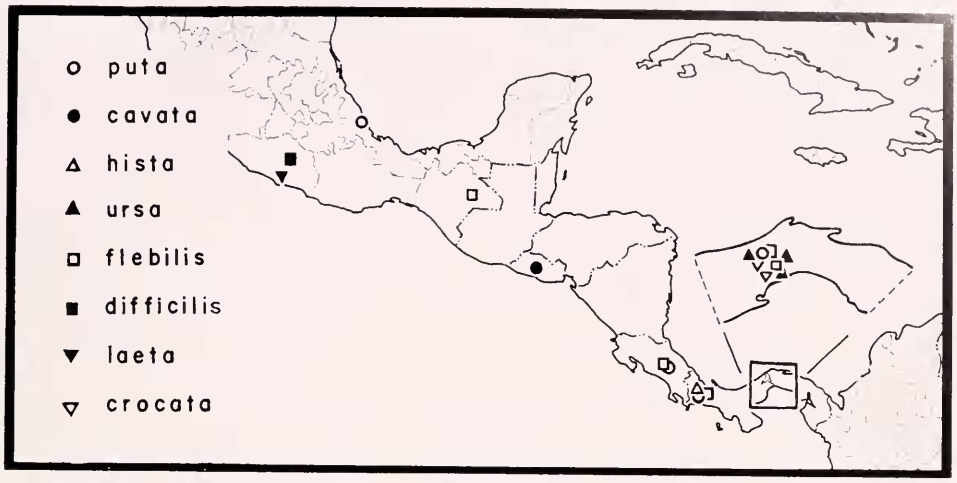
Width of eye rows: AME .28, .28, .30 mm; ALE .69, .72, .72 mm; PLE 1.20, 1.22, 1.27 mm; PME .70, .74, .75 mm.

Segments of leg I: femur 2.5, 2.7, 2.7 mm; patella-tibia 3.3, 3.5, 3.5 mm; metatarsus 2.0, 2.0, 2.1 mm; tarsus 1.0, 1.0, 1.0 mm; total length I 8.8, 9.2, 9.3 mm.

Patella-tibiae: II 2.9, 3.1, 3.1 mm; III 2.4, 2.5, – – mm; IV 2.3, 2.3, 2.4 mm.

Color. Female. Pattern illustrated in Figures 1 and 2. Face yellow-orange to orange-brown, lower edge of clypeus yellowish. Chelicerae yellow-orange to orange-brown with tuft of white hairs along inner margins of basal segments.

Carapace yellow-orange to orange-brown with darker brown hairs along vertical sides.



MAP 2

Dorsum of abdomen white to cream with cardiac area translucent white. Lateral areas darker brown. Venter of abdomen cream to pale yellow with broad median dusky stripe from epigastric furrow to base of spinnerets, margined by thin pale yellow stripe laterally.

Legs cream to pale yellow with metatarsi and tarsi darker, brownish.

Labium and endites pale yellow-orange, distal ends ivory. Sternum yellow.

Diagnosis. In *H. cheta* the PME row is subequal to the ALE row in width and the AME are well below the ALE (see Fig. 1) as in the *banksi* species group. The shape of the epigynum also conforms generally to that of *H. barroana*. For these reasons *H. cheta* is considered a member of the *banksi* species group. This species is easily distinguished from *H. barroana* and other species of the *banksi* group by its larger size and the structure of the epigynum (Figs. 63, 64).

Distribution. Guatemala (Map 1).

Records. GUATEMALA. Cobán, July 1947, 3♀♀ (C., P. Vaurie).

Hamataliwa puta (O.P.-Cambridge)

Figures 21, 22, 33, 34, 65–67, 113–119. Map 2.

Oxyopeidon putum O.P.-Cambridge, 1894, Biologia Centrali-Americana, Arachnida, Araneidea, 1:140, pl. 16, figs. 7, 7a–e, 8, 8a–c, ♂♀. Male lectotype, here designated, from Bugaba, Panama, in British Museum (Natural History) examined. F.O.P.-Cambridge, 1902, *op. cit.*, 2:347.

Measurements. Length of six males 4.7–5.3 mm, mean 5.04 mm; carapace width 1.8–2.2 mm, mean 1.93 mm; carapace length 2.1–2.5 mm, mean 2.23 mm.

Width of eye rows: AME .25–.27 mm, mean .256 mm; ALE .70–.75 mm, mean .737 mm; PLE 1.30–1.42 mm, mean 1.350 mm; PME .92–.99 mm, mean .960 mm.

Segments of leg I: femur 2.4–2.8 mm (5), patella-tibia 3.3–3.5 mm (3), metatarsus 2.1–2.5 mm (3), tarsus 1.0–1.2 mm (2), total length I 8.9–9.9 mm (2).

Length of patella-tibiae: II 2.6–3.4 mm (3), III 1.9–2.6 mm (3), IV 1.9–2.3 mm (3).

In most cases a leg or leg segment was missing, so for these particular measurements only the range is given, with the number of specimens in parentheses.

Length of ten females 4.7–6.1 mm, mean 5.36 mm; carapace width 1.6–2.0 mm, mean 1.79 mm; carapace length 2.0–2.4 mm, mean 2.18 mm.

Width of eye rows: AME .22–.28 mm, mean .254 mm; ALE .70–.80 mm, mean .746 mm; PLE 1.30–1.50 mm, mean 1.363 mm; PME .95–1.07 mm, mean .985 mm.

Segments of leg I: femur 2.0–2.4 mm, mean 2.18 mm; patella-tibia 2.5–2.9 mm, mean 2.68 mm; metatarsus 1.5–1.8 mm, mean 1.64 mm; tarsus .7–.9 mm, mean .80 mm; total length I 6.7–7.8 mm, mean 7.29 mm.

Length of patella-tibiae: II 2.2–2.8 mm, mean 2.45 mm; III 1.6–2.0 mm, mean 1.79 mm; IV 1.5–1.9 mm, mean 1.69 mm.

Color. Male. Pattern illustrated in Figures 33 and 34. In one male in good condition, the face and chelicerae are yellow-orange and clothed with white spatulate hairs. The sides of the face above the cheliceral articulation are darker brown. In rubbed specimens the face and chelicerae are orange-brown, with the lower edge of the clypeus and distal ends of chelicerae lighter. Palpi dark brown.

Carapace orange to orange-brown with darker brown hairs along sides.

Dorsum of abdomen pale yellow to cream. Venter pale yellow to cream without darker median stripe.

Legs pale yellow to yellow-orange.

Sternum cream to yellow-orange or amber. Labium and endites pale yellow to orange, cream distally.

Female. Pattern illustrated in Figures 21 and 22. Face and chelicerae orange-brown, usually with lighter cream color along lower edge of clypeus and sometimes at distal ends of chelicerae.

Carapace orange-brown. Dorsum of abdomen cream colored to tan with scattered patches of brown spatulate hairs. Venter cream to pale yellow. No darker markings.

Legs yellow to yellow-orange.

Labium and endites yellow to light orange, distal ends paler. Sternum cream to yellow.

Diagnosis. Hamataliwa puta is closely related to *H. ursa.* The structure of the epigyna and the female genitalia is very similar (compare Figs. 65–67 with Figs. 68–69), but the tibial apophysis of the palpus in *H. ursa* is much larger than it is in *H. puta* (compare Figs. 111–112 with Figs 113–119). For further discussion see the diagnosis of *H. ursa.*

Distribution. Mexico and Central America (Map 2).

Records. MEXICO. *Veracruz.* Veracruz, ♂ (N. Banks).

COSTA RICA. Antonios, ♂ (N. Banks).

PANAMA. Bugaba (Chiriquí, 22 km NW of David), ♂♂:10♀♀ (C. G. Champion). *Canal Zone.* Barro Colorado Island, 31 July 1954, ♂ (A. M. Chickering).

Hamataliwa ursa sp. n.

Figures 19, 20, 31, 32, 68, 69, 111, 112. Map 2.

Holotype. Male from Barro Colorado Island, Panama Canal Zone. June 1950 (A. M. Chickering), in the Museum of Comparative Zoology. The specific name is a noun in apposition meaning bear.

Measurements. Length of nine males 4.4–5.0 mm, mean 4.74 mm; carapace width 1.7–2.0 mm, mean 2.19 mm; carapace length 2.0–2.4 mm, mean 2.19 mm.

Width of eye rows: AME .22–.25 mm, mean .239 mm; ALE .65–.75 mm, mean .705 mm; PLE 1.19–1.39 mm, mean 1.306 mm; PME .87–.97 mm, mean .926 mm.

Segments of leg I: femur 2.1–2.6 mm, mean 2.39 mm; patella-tibia 2.7–3.3 mm, mean 2.99 mm; metatarsus 1.8–2.2 mm, mean 2.01 mm; tarsus .9–1.0 mm, mean .96 mm; total length 7.5–8.9 mm, mean 8.36 mm.

Length of patella-tibiae: II 2.4–3.0 mm, mean 2.73 mm; III 1.9–2.2 mm, mean 2.06 mm; IV 1.8–2.0 mm, mean 1.87 mm.

Length of ten females 5.3–6.7 mm, mean 6.04 mm; carapace width 1.9–2.2 mm, mean 2.02 mm; carapace length 2.3–2.6 mm, mean 2.43 mm

Width of eye rows: AME .27–.30 mm, mean .277 mm; ALE .78–.85 mm, mean .815 mm; PLE 1.45–1.64 mm, mean 1.536 mm; PME 1.02–1.19 mm, mean 1.102 mm.

Segments of leg I: femur 2.4–2.7 mm, mean 2.48 mm; patella-tibia 2.9–3.5 mm,

mean 3.13 mm; metatarsus 1.8–2.0 mm, mean 1.84 mm; tarsus .8–1.0 mm, mean .88 mm; total length I 7.9–9.2 mm, mean 8.33 mm.

Length of patella-tibiae: II 2.7–3.0 mm, mean 2.82 mm; III 1.9–2.2 mm, mean 2.02 mm; IV 1.8–2.1 mm, mean 1.91 mm.

Color. Male. Pattern illustrated in Figures 31 and 32. Coloration very similar to that of the female. In the male illustrated there are more brown spatulate hairs along the sides of the abdomen than in the female. Cymbia of palpi brown.

Color. Female. Pattern illustrated in Figures 19 and 20. Face and chelicerae yellow-orange to brownish orange, overlaid with darker hairs. White spatulate hairs at sides of face, thinning anteriorly. Lower edge of clypeus with yellowish tinge.

Carapace yellow-orange overlaid with brown spatulate hairs imparting a brownish orange tint. Darker along vertical sides.

Dorsum of abdomen cream to yellow with scattered patches of brown hair. Brown indentations about one-third of the distance from spinnerets to base of abdomen. Cardiac region and sometimes muscle depressions well marked. Venter cream to yellow with only a faint broad dusky stripe from epigastric furrow to base of spinnerets.

Legs yellow with darker brown spatulate hairs.

Labium yellow to light brown. Endites cream to yellow. Sternum ivory to cream.

Diagnosis. Hamataliwa ursa is very similar to *H. puta* in body size, leg length, and eye arrangement (compare measurements of these components). However, the epigynum of *H. ursa* is more broadly rounded than that of *H. puta* (compare Fig. 69 with Fig. 66) and the tibial apophysis of the male palpus in *H. ursa* is considerably larger than that in *H. puta* (compare Figs. 111–112 with Figs. 113–119).

The internal genitalia of the females are very much alike (compare Fig. 68 with Fig. 65); this similarity may be considered as good evidence for conspecificity. Males of *H. ursa*, however, are easily distinguished from *H. puta* males by the tibial apophysis.

Because of the differences in the males of the two groups, they are considered as separate species here. Further collections and field studies should elucidate the relationships of the populations concerned.

Distribution. Panama (Map 2).

Records. PANAMA. *Canal Zone.* Barro Colorado Island, numerous ♂♂♀♀ (A. M. Chickering); Madden Dam, 18 Aug. 1936, ♀, 25–31 July 1950, ♀ (A. M. Chickering); Summit, 7–10 July 1950, 4♀♀, 21–29 July 1950, 5♀♀, 16–17 Aug. 1950, 7♀♀;oo, 23–28 Aug. 1950, 4♀♀ (A. M. Chickering).

Hamataliwa cavata (Kraus)

Figures 17, 18, 29, 30, 73, 74, 109, 110. Map 2.

Oxyopeidon cavatum Kraus, 1955, Abh. Senckenb. Naturf. Ges., no. 493, p. 39, figs 99–101, ♂♀. Male holotype from San Salvador, El Salvador, in Senckenberg Museum, examined.

Measurements. Length of male holotype 4.3 mm, carapace width 1.8 mm, carapace length 2.3 mm.

Width of eye rows: AME .23 mm, ALE .78 mm, PLE 1.45 mm, PME 1.04 mm.

Segments of leg I: femur 2.4 mm, patella-tibia 3.0 mm, metatarsus 2.0 mm, tarsus 0.9 mm, total length 8.3 mm.

Length of patella-tibiae: II 2.8 mm, III 2.0 mm, IV 1.9 mm.

Length of female 6.0 mm, carapace width 2.3 mm, carapace length 2.6 mm.

Width of eye rows: AME .20 mm, ALE .62 mm, PLE 1.17 mm, PME .90 mm.

Segments of leg I: femur 2.5 mm, patella-tibia 3.2 mm, metatarsus 1.9 mm, tarsus 1.0 mm, total length I 8.6 mm.

Length of patella-tibiae: II 2.9 mm, III 2.0 mm, IV 2.0 mm.

Color. Male. Pattern illustrated in Figures 29 and 30. Face and chelicerae pale orange-yellow, lower edge of clypeus

lighter. Indistinct median white stripe from AME to lower edge of clypeus.

Carapace pale orange-yellow to golden.

Abdomen somewhat shriveled. Dorsum pale yellow, cardiac area with darker hairs overlying it. No well-defined darker markings. Venter of abdomen cream colored.

Legs pale yellow. Femora somewhat darker. No distinct darker markings.

Labium and endites pale yellow to cream. Outer margins of distal ends dark, heavily sclerotized. Sternum cream colored.

Color. Female. Pattern illustrated in Figures 17 and 18. Face and chelicerae light brownish orange. Darker at edges of face. Faint white stripe from ALE toward cheliceral condyles. Lighter median line from AME to lower edge of clypeus.

Carapace yellow-orange to golden, overlaid with brown spatulate hairs, abundant in eye region and at sides and posterior declivity.

Dorsum of abdomen yellow-orange to cream colored. Mixture of light hairs and brownish spatulate hairs. Mottled brown anteriorly with darker brown patches near posterior end as illustrated.

Legs yellow without darker markings.

Labium and endites pale yellow-orange. Sternum cream colored.

Diagnosis. Hamataliwa cavata is similar to *H. puta* in body structure, eye arrangement, and in the structure of the genitalia. Differences in bodily proportions between *H. cavata* and *H. puta* can be seen by comparing measurements.

The male palpi of the two species are very similar (compare Figs. 109 and 110 with Figs. 113–119), but the genitalia of the females are quite distinct (compare Figs. 73, 74 with Figs. 65–67). Because of the distinct epigynum and because of slight differences in palpal sclerites of the males, *H. cavata* is considered a separate species here.

Distribution. El Salvador (Map 2).

Record. EL SALVADOR, San Salvador, Tropical Institute, ♂ ♀ 700 m, 30 Apr. 1957 (A. Zilch).

Hamataliwa hista sp. n.

Figures 15, 16, 27, 28, 75, 76, 107, 108. Map 2.

Holotype. Male from Boquete, Panama, 4–11 Aug. 1954 (A. M. Chickering), in the Museum of Comparatize Zoology. The specific name is a noun in apposition meaning snake.

Measurements. Length of three males 4.7–5.1 mm, carapace width of four males 1.8–2.0 mm, carapace length 2.1–2.4 mm.

Width of eye rows: AME .23–.25 mm, ALE .67–.72 mm, PLE 1.22–1.34 mm, PME .84–.90 mm.

Segments of leg 1: femur 2.5 mm, patella-tibia 3.1–3.4 mm, metatarsus 2.1–2.3 mm, tarsus 1.0–1.1 mm, total length I 8.8–9.2 mm.

Length of patella-tibiae: II 2.8–3.0 mm, III 2.0–2.2 mm, IV 1.9–2.0 mm.

Length of ten females 5.8–7.4 mm, mean 6.49 mm; carapace width 2.0–2.2 mm, mean 2.15 mm; carapace length 2.5–2.7 mm, mean 2.60 mm.

Width of eye rows: AME .28–.30 mm, mean .292 mm; ALE .80–.85 mm, mean .827 mm; PLE 1.50–1.64 mm, mean 1.575 mm; PME 1.04–1.15 mm, mean 1.104 mm.

Segments of leg I: femur 2.5–2.8 mm, mean 2.59 mm; patella-tibia 3.1–3.5 mm, mean 3.33 mm; metatarsus 1.8–2.1 mm, mean 1.98 mm; tarsus .9–1.0 mm, mean .95 mm; total length 8.4–9.2 mm, mean 8.83 mm.

Length of patella-tibiae: II 2.7–3.1 mm, mean 2.96 mm; III 2.0–2.3 mm, mean 2.12 mm; IV 1.9–2.1 mm, mean 2.04 mm.

Color. Male. Pattern illustrated in Figures 27 and 28. Color essentially same as in female. Carapace yellow.

Cymbia of palpi brown. Labium, endites, and sternum somewhat lighter than in female.

Color. Female. Pattern illustrated in Figures 15 and 16. Face yellow-orange, lighter yellow along lower edge of clypeus. Chelicerae yellow-orange with sub-distal regions of basal segments lighter.

Carapace yellow-orange with scattered brown spatulate hairs along sides.

Dorsum of abdomen cream colored, overlaid with irregular patches of darker spatulate hair, denser in cardiac region and along sides. Venter cream to yellow.

Legs yellow without distinct markings. Distal segments darker.

Labium yellow to light brown. Endites yellow to brownish yellow. Sternum cream to pale yellow.

Diagnosis. Hamataliwa hista is similar to *H. puta* in eye arrangement and the structure of the male palpal organs (compare Figs. 107, 108 with Figs. 113–119). However, the cymbium is more oval and the embolus is longer in *H. hista.* The females are easily distinguished on the basis of the epigyna (compare Figs. 75, 76 with Figs. 65–67).

Distribution. Panama (Map 2).

Records. PANAMA. Boquete, 1–8 Aug. 1950, ♂:8♀♀, 4–11 Aug. 1954, 3♂♂:17♀♀ (A. M. Chickering).

Hamataliwa flebilis (O.P.-Cambridge)

Figures 13, 14, 25, 26, 70–72, 124, 125. Map 2.

Oxyopeidon flebile O. P. - Cambridge, 1894, Biologia Centrali-Americana, Arachnida, Araneidea, 1:141, pl. 16, figs. 9, 9a–9c, ♀. Holotype male, designated by F.O.P.-Cambridge, from Bugaba, Panama, in British Museum (Natural History), examined. F.O.P. - Cambridge, 1902, *op. cit.*, 2:347, pl. 32, fig. 32, ♀.

Measurements. Length of male holotype 5.1 mm, carapace width 1.9 mm, carapace length 2.4 mm.

Width of eye rows: AME .27 mm, ALE .75 mm, PLE 1.37 mm, PME .97 mm.

Segments of leg I: femur 2.7 mm, patella-tibia 3.4 mm, metatarsus 2.3 mm, tarsus 1.0 mm, total length I 9.4 mm.

Length of patella-tibiae: II 3.0 mm, III 2.2 mm, IV 1.0 mm.

Length of ten females 5.7–7.4 mm, mean 6.46 mm; carapace width 1.9–2.3 mm, mean 2.09 mm; carapace length 2.3–2.7 mm, mean 2.50 mm.

Width of eye rows: AME .27–.30 mm, mean .294 mm; ALE .78–.86 mm, mean .837 mm; PLE 1.45–1.67 mm, mean 1.570 mm; PME 1.04–1.24 mm, mean 1.136 mm.

Segments of leg I: femur 2.4–2.9 mm, mean 2.53 mm; patella-tibia 2.8–3.4 mm, mean 3.15 mm; metatarsus 1.8–2.1 mm, mean 1.87 mm; tarsus .8–1.0 mm, mean .91 mm; total length I 8.2–9.3 mm, mean 8.45 mm.

Length of patella-tibiae: II 2.5–3.1 mm, mean 2.83 mm; III 1.9–2.4 mm, mean 2.07 mm; IV 1.8–2.2 mm, mean 1.96.

Color. Male. Pattern illustrated in Figures 25 and 26. Face and chelicerae yellow-orange, devoid of overlying hairs.

Carapace yellow-orange.

Dorsum of abdomen yellow, darker brownish along sides. Muscle depressions also marked by brownish hairs.

Venter of abdomen pale yellow.

Legs yellow. Labium and endites pale yellow. Sternum cream.

Palpi light yellow-orange with darker brown sclerites showing through cymbium.

Color. Female. Pattern illustrated in Figures 13 and 14. Face and chelicerae yellow-orange to orange-brown with fine clothing of white hair. Lighter yellowish along lower margin of clypeus and distal ends of chelicerae. The hexagonal area bounded by the eyes is reddish in some well-marked specimens.

Carapace yellow-orange to orange-brown with clothing of fine white hair. Several specimens have a clothing of fine brown hair rather than white.

Dorsum of abdomen cream to pale yellow. Cardiac area easily discernible, sometimes clothed with brown spatulate hairs. In most specimens there are only a few scattered brown hairs over much of the dorsal surface. They cover the cardiac region and form two spots posteriorly. In these forms a large patch of brown spatulate hairs occurs just posterior to the cervical groove.

Venter of abdomen cream to pale yellow without darker markings.

Proximal leg segments pale yellow without darker markings. Tarsi and metatarsi tend to be darker brownish yellow.

Labium, endites, and sternum cream to pale yellow.

Diagnosis. Hamataliwa flebilis is placed in the *puta* species group because of the greater width of the PME row as compared with the ALE (also compare measurements with *H. puta*) and because of the closeness of the AME to the ALE (Figs. 13, 14).

The palpal sclerites of *H. flebilis* are similar to those of other species in the *H. puta* complex, but the tibial apophysis is distinct from that of other members of this group (compare Figs. 124–125 with Figs. 107–119). The epigynum and internal genitalia of *H. flebilis* readily separate it from other females of this group (Figs. 70–72).

Records. MEXICO. *Chiapas.* Finca El Real, 1–7 July 1950, ♀ (C. M. Goodnight, L. Stannard).

COSTA RICA. San José, ♂ (E. Schmidt).

PANAMA. Bugaba (Chiriquí, 22 km NW of David), ♂:13♀♀ (G. C. Champion). *Canal Zone.* Barro Colorado Island, 20 July 1954, ♀o, 18 Aug. 1954, ♀, 4 Feb. 1958, ♀:3oo; Gamboa, 24 July 1950, ♀ (A. M. Chickering); Summit, 23 Apr. 1953 ♀♀ (A. M. Nadler). Chilibre, 11 July 1950, ♀ (A. M. Chickering).

Hamataliwa difficilis (O.P.-Cambridge)

Figures 40, 41, 85–88. Map 2.

Oxyopeidon difficile O. P.-Cambridge, 1894, Biologia Centrali-Americana, Arachnida, Araneidea, 1:142, pl. 16, figs. 13, 13a–13c, ♀. Female lectotype, here designated, from Amula, Guerrero, Mexico, in British Museum (Natural History), examined. F.O.P.-Cambridge, *op. cit.*, 2:348.

Oxyopeidon molestum O. P.-Cambridge, 1894, Biologia Centrali-Americana, Arachnida, Araneidea, 1:141, pl. 16, figs. 15, 15a–15c, ♀. Female holotype from Amula, Guerrero, Mexico, in British Museum (Natural History), examined. F.O.P.-Cambridge, 1902, *op. cit.*, 2:348, pl. 32, fig. 35, ♀. NEW SYNONYMY.

Discussion. Hamataliwa difficilis and *Hamataliwa molesta* described under *Oxyopeidon* by O. P.-Cambridge are undoubtedly the same species. (compare Figs. 85, 87 with Fig. 88). On examination, the holotype of *O. molestum* still retained a hard plug in the median depression of the epigynum. It is so drawn in figure 15c, plate 16 of the *Biologia Centrali-Americana, Arachnida, Araneidea*, volume I. Upon removal of this plug, the epigynum (Fig. 88) was found to be identical to that of *H. difficilis. Hamataliwa difficilis* was selected as the name of the species because of the more accurate drawing of the epigynum in figure 13c, plate 16 of the *Biologia.*

Measurements. Length of two females 5.2, 6.6 mm, carapace width 1.9, 1.9 mm, carapace length 2.2, 2.2 mm.

Width of eye rows (three females): AME .25, .27, .28 mm, ALE .70, .72, .77 mm, PLE 1.25, 1.34, 1.34 mm.

Segments of leg I: femur 2.4, 2.4, 2.5 mm; patella-tibia 2.8, 2.9, 3.1 mm; metatarsus 1.9, 1.9, 1.9 mm; tarsus .8, .9, 1.0 mm; total length I 7.8, 8.0, 8.4 mm.

Length of patella-tibiae: II 2.6, 2.7, 2.7 mm; III 2.0, 2.1, 2.1 mm; IV 1.9, 2.0, 2.0 mm.

Color. Female. Because of their condition, color descriptions of the above three specimens would serve no useful purpose. Instead, the original color descriptions of O. P.-Cambridge follow. They are both quoted because of the obvious differences in coloration.

Oxyopeidon molestum: "Cephalothorax and falces deep brown, thinly clothed with squamose grey hairs.

"The legs are pale yellowish, the femora of the first three pairs two-thirds brown at their anterior extremities, while that part of the femora of the fourth pair is marked with a more decided dark brown annulus, the tibiae also are dark brown at their anterior extremities.

"The abdomen is deep blackish-brown, with a pale patch at the fore extremity on

the upperside, bearing a short longitudinal black marking, this patch is conspicuous from numerous white hairs; two indistinct reddish round spots or blotches form a transverse line across the middle of the upperside. (The abdomen had evidently been more or less densely clothed with squamose and other hairs, of a grey, reddish, and yellowish colour, but many had been rubbed off.) The underside is nearly black, with a distinct yellowish border, and two nearly parallel longitudinal yellowish lines from the genital aperture, converging towards the hinder extremity."

Oxyopeidon difficile: "Cephalothorax yellow-brown, clothed with short grey hairs, the sides are marked with a broken marginal line and irregular converging lines of blackish hue.

"Legs brownish-yellow, an imperfect band across the middle of the femora, the posterior extremities of the tibiae blackish; the metatarsi of the third and fourth pair also indistinctly annulated with blackish.

"Abdomen yellowish-brown, clothed with short whitish and other hairs; the upperside has an irregular black bar along the middle, followed by some irregular black angular bars or chevrons above the spinners, and some irregular black patches or markings on the sides; the underside has a broad longitudinal dark brown band.

"The falces are yellow-brown, tolerably long, strong, clothed with short grey hairs.

"The maxillae, labium, and sternum are dull yellow, the maxillae and labium tinged with brown."

Diagnosis. Hamataliwa difficilis is associated with the *puta* species group. It is placed here chiefly because of the greater width of the PME as compared to the ALE (see measurements), and the position of the AME in relation to the AME (Figs. 40, 41).

The epigynum of *H. difficilis* is very distinct from that of all other species of *Hamataliwa* investigated (Figs. 85–88).

Distribution. Mexico (Map 2).

Record. MEXICO. *Guerrero.* Amula, 9.5 km NW of Chilapa, 3♀♀ (H. H. Smith).

Hamataliwa laeta (O.P.-Cambridge)

Figures 42, 79, 80. Map 2.

Oxyopeidon laetum O.P.-Cambridge 1894, Biologia Centrali-Americana, Arachnida, Araneidea, 1:142, pl. 16, figs. 10, 10a–10c, ♀. Female holotype from Dos Caminos, Guerrero, Mexico, in British Museum (Natural History), examined. F.O.P.-Cambridge, 1902, *op. cit.*, 2:347, pl. 32, fig. 33, ♀.

Measurements. Length of female holotype 5.4 mm, carapace width 1.9 mm, carapace length 2.4 mm.

Width of eye rows: AME .27 mm, ALE .84 mm, PLE 1.47 mm, PME 1.14 mm.

Segments of leg I: femur 2.4 mm, patella-tibia 2.9 mm, metatarsus 1.7 mm, tarsus .9 mm, total length I 7.9 mm.

Length of patella-tibiae: II 2.6 mm, III 1.9 mm, IV 1.9 mm.

Color. Female holotype. Since the color has been altered by handling and long preservation in alcohol, the original description by O. P.-Cambridge is given.

"The cephalothorax is yellow-brown, the ocular area reddish; it is clothed with squamose grey hairs, of which one or more conspicuous lines mark out the ocular area and the limits of the clypeus.

"Falces similar in colour and clothing to the cephalothorax.

"Legs yellow, very slightly indeed tinged with brown near the middle of the femora.

"Abdomen dull brownish-yellow above, with two rather converging longitudinal black lines near the middle, and a distinct black patch on each side a little above the spinners, from which to a little way upwards is a series of short, indistinct, subangular, brownish lines or chevrons; there are also some other indistinct yellow-brown markings near the middle and on the sides. The abdomen is clothed with squamose grey hairs. The underside is dusky brown."

Diagnosis. The holotype female, al-

though mounted on a pin running through it longitudinally, is in relatively good condition. The structure of the epigynum together with the eye arrangement separates it from all other species of *Hamataliwa* studied. It is placed in the *puta* species group because of the greater width of the PME row compared with the ALE row (Fig. 42). The structure of the epigynum (Figs. 79, 80) is in general conformity with this group also, but until the male is discovered and the internal female genitalia studied, the placement of *H. laeta* in the *puta* species group remains an arbitrary decision.

Distribution. Mexico (Map 2).

Record. MEXICO. *Guerrero.* Dos Caminos, 37 km S of Chilpancingo, ♀ (H. H. Smith).

Hamataliwa crocata sp. n.

Figures 23, 24, 35, 36, 77, 78, 126, 127. Map 2.

Holotype. Male from Summit, Panama Canal Zone, 23–28 Aug. 1950 (A. M. Chickering), in Museum of Comparative Zoology. The specific name is an adjective meaning yellow.

Measurements. Length of four males 4.3–4.7 mm, carapace width 1.7–1.9 mm, carapace length 1.8–2.1 mm.

Width of eye rows: AME .23–.25 mm, ALE .70–.80 mm, PLE 1.30–1.48 mm, PME 1.00–1.13 mm.

Segments of leg I: femur 2.1–2.4 mm, patella-tibia 2.8–3.2 mm, metatarsus 1.9–2.1 mm, tarsus .9–1.0 mm, total length I 7.5–8.6 mm.

Length of patella-tibiae: II 2.5–2.9 mm, III 1.9–2.0 mm, IV 1.7–1.9 mm.

Length of 10 females 4.0–5.7 mm, mean 5.24 mm; carapace width 1.6–2.1 mm, mean 1.86 mm; carapace length 1.8–2.2 mm, mean 2.03 mm.

Width of eye rows: AME .25–.27 mm, mean .255 mm; ALE .78–.93 mm, mean .853 mm; PLE 1.40–1.73 mm, mean 1.573 mm; PME 1.08–1.38 mm, mean 1.230 mm.

Segments of leg I: femur 2.0–2.4 mm, mean 2.20 mm; patella-tibia 2.5–3.3 mm, mean 2.88 mm; metatarsus 1.5–1.9 mm, mean 1.67 mm; tarsus .8–.9 mm, mean .79 mm; total length I 6.7–8.4 mm, mean 7.53 mm.

Length of patella-tibiae: II 2.3–2.9 mm, mean 2.55 mm; III 1.6–2.0 mm, mean 1.84 mm; IV 1.5–2.0 mm, mean 1.76 mm.

Color. Male. Pattern illustrated in Figures 35 and 36. Coloration essentially as in the female except that the darker brown spatulate hairs are not as abundant. Cymbium of palpus dark brown.

Color. Female. Pattern illustrated in Figures 23 and 24. Face pale orange-yellow, beneath clothing of dark brown spatulate hairs. As the brown spatulate hairs are rubbed off the specimens become much paler in appearance. Chelicerae pale orange-yellow.

Carapace pale orange-yellow to brownish orange. Brown color contributed by spatulate hairs, thickest in eye region and along vertical sides.

Dorsum of abdomen cream to pale yellow, usually with clothing of closely packed dark brown hairs forming irregular pattern. Venter of abdomen cream color without darker median stripe.

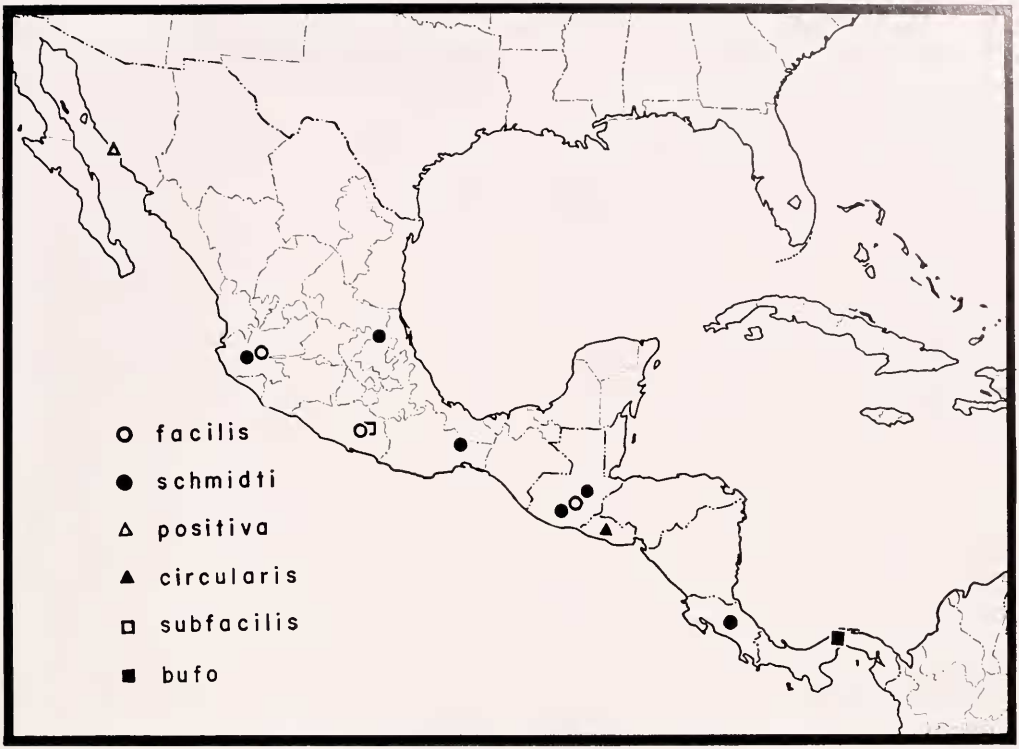
Legs pale yellow to yellow-orange, usually lighter than carapace.

Labium and endites cream to pale yellow. Sternum ivory to cream.

Diagnosis. Hamataliwa crocata is arbitrarily placed in the *puta* species group because of the width of the PME row in relation to the ALE (see measurements) and the position of the AME in relation to the ALE (Figs. 23, 24). Although the eye arrangement is reminiscent of *H. puta*, both the epigynum (Figs. 77, 78) and male palpus (Figs. 126, 127) of *H. crocata* are quite distinct from other members of the *puta* species group.

Distribution. Panama (Map 2).

Records. PANAMA. *Canal Zone.* Barro Colorado Island, 30 July 1950, ♀; Summit,



MAP 3

21–29 July 1950, ♂:8♀♀, 23–28 Aug. 1950, 4♂♂:♀ (A. M. Chickering).

Hamataliwa facilis (O.P.-Cambridge)

Figures 44, 94–98. Map 3.

Oxyopeidon facile O.P.-Cambridge, 1894, Biologia Centrali-Americana, Arachnida, Araneidea, 1: 140, pl. 16, figs. 6, 6a–6c, ♀. Female holotype from Chilpancingo, Guerrero, Mexico, in British Museum (Natural History), examined.

Hamataliwa facilis F.O.P.-Cambridge, 1902, Biologia Centrali-Americana, Arachnida, Araneidea, 2:349, pl. 32, figs. 36, 36a, 36b, ♀.

Discussion. *Oxyopeidon facile* described by O. P.-Cambridge was placed in the genus *Hamataliwa* by F.O.P.-Cambridge because of the position of the AME in relation to the ALE. He also pointed out that the PME were farther apart than they were in other species of *Oxyopeidon*. The arrangement of the eyes in *H. facilis* (Fig. 44) is a distinctive feature of this species, but it is not considered a valid criterion for separating *H. facilis* generically from other species of *Oxyopeidon*, now also placed in *Hamataliwa*.

Measurements. Length of three females 6.8, 7.4, 7.9 mm; carapace width 2.4, 2.5, 2.6 mm; carapace length (estimated) 2.8, 3.0, 3.1 mm.

Width of eye rows: AME .30, .32, .33 mm; ALE 1.48, 1.48, 1.50 mm; PLE 2.29, 2.30, 2.30 mm; PME 1.84, 1.85, 1.88 mm.

Segments of leg I: femur 3.0, 3.0, 3.4 mm; patella-tibia 4.0, 4.1, 4.2 mm; metatarsus 2.2, 2.2, 2.4 mm, tarsus – –, 1.0 ,1.4 mm; total length – –, 10.2, 11.4 mm.

Length of patella-tibiae: II 3.5, 3.8, 4.0 mm; III 2.6, 2.8, 3.4 mm; IV 2.5, – –, – –, mm.

Color. Female. Pattern on face illustrated in Figure 44. Because the specimens representing this species are in poor condition and because discoloration is likely, the original description by O. P. Cambridge is given.

"Cephalothorax dark yellow, brown, clothed in parts (probably in a more perfect specimen entirely so) with white squamose hairs.

"Eyes on diffused black spots.

"Legs and palpi yellow-brown, paler than the cephalothorax.

"Falces similar in color to the cephalothorax, and clothed with white squamose hairs, especially towards the base.

"Maxillae, labium and sternum similar to the legs in colour.

"Abdomen dark brown on the upperside, clothed with short reddish and grey squamose hairs; along the middle of the fore part is a darker obscure stripe, and there are some black markings above the spinners; the sides have each a kind of obscure broken longitudinal stripe or line of patches and spots of yellow-brown, some of them more or less confluent, and appearing to be clothed with white hairs longer than the rest; these lines of spots end near the spinners. The underside has a broad, longitudinal, central, black-brown band, margined with a brownish-yellow stripe. The spinners are short, compact, and of a dark-brown colour."

Diagnosis. The female holotype of *H. facilis* has a unique epigynum as illustrated in Figures 94, 95. Although the epigyna of the two female paratypes are different (Figs. 96–98), the similarity of these two specimens to the holotype in other morphological features indicates conspecificity (compare measurements of the three specimens above). This particular case stresses the value of measuring a number of morphological components in order to determine the relationship between specimens. The epigyna of the paratypes somewhat resemble those of *H. positiva* or *H. schmidti* (compare Figs. 96–98 with Figs. 89–91, 93), but the eye arrangement of *H. facilis* readily separates it from these two species (compare Fig. 44 with Figs. 43, 46).

Distribution. Mexico, Guatemala (Map 3).

Records. MEXICO. *Jalisco.* ♀. *Guerrero.* Chilpancingo, ♀ (H. H. Smith).

GUATEMALA. ♀ (Sargent).

Hamataliwa positiva Chamberlin

Figures 43, 93. Map 3.

Hamataliwa positiva Chamberlin, 1924, Proc. California Acad. Sci., 12:677, fig. 118, ♀. Female holotype from San Carlos Bay, Sonora, July 7, 1921 (E. P. Van Duzee) in American Museum of Natural History (Calif. Acad. Sci. collection), examined.

Measurements. Length of female holotype 7.9 mm, carapace width 2.5 mm, carapace length 3.1 mm.

Width of eye rows: AME .33 mm, ALE 1.14 mm, PLE 1.97 mm, PME 1.65 mm.

Segments of leg I: femur 3.0 mm, patella-tibia 4.0 mm, metatarsus 2.3 mm, tarsus 1.1 mm, total length I 10.4 mm.

Length of patella-tibiae: II 3.7 mm, III 2.5 mm, IV 2.5 mm.

Color. Female. Pattern on face illustrated in Figure 43.

Integument of face and chelicerae, dark brown clothed with white appressed hair.

Carapace dark (chestnut) brown, heavily overlaid with white hair.

Dorsum of abdomen dark brown with overlying white hair. Venter with wide dark brown median stripe from epigastric furrow to spinnerets, enclosed by thick white appressed hair on each side.

Legs orange-brown, heavily fringed with white hairs.

Labium orange-brown, long white hair at base. Endites pale orange-brown, distal ends lighter, long white hair basally. Sternum orange-brown.

Diagnosis. Hamataliwa positiva resembles *H. unca* in size and eye arrangement and in the general shape of the epigynum. It is somewhat larger than *H. unca* and the legs are proportionally longer (compare measurements). The epigynum of *H. positiva* is greater in length from anterior to posterior than that of *H. unca.*

The epigyna of the paratypes of *H. facilis* resemble those of *H. positiva* (com-

pare Figs. 97, 98 with Fig. 93), but the eye arrangements in these two species are quite different (compare Fig. 44 with Fig. 43).

Distribution. Mexico (Map 3).

Records. MEXICO. *Sonora.* San Carlos Bay, 7 July 1921, ♀ (E. P. Van Duzee).

Hamataliwa unca Brady

Hamataliwa unca Brady, 1964, Bull. Mus. of Comp. Zool., 131:499, pls. 14–17, figs, 110, 111, 117, 118, 122, 123, 128, 129, ♂ ♀. Male holotype from Edinburg, Hidalgo Co., Texas, in American Museum of Natural History.

This species is recorded from the southern tip of Texas, and it almost certainly occurs further south into Mexico. The epigynum is somewhat similar to that of *H. positiva,* but it can be easily differentiated from the epigynum of that species. (compare figs. 117, 118 of Brady, 1964, with Fig. 93 of this paper). Also see the diagnosis of *H. positiva.*

Hamataliwa subfacilis (O.P.-Cambridge)

Figures 45, 92. Map 3.

Oxyopeidon subfacile O.P.-Cambridge, 1894, Biologia Centrali-Americana, Arachnida, Araneidea, 1:141, pl. 16, figs. 5, 5a–5c, ♀. Female holotype from Amula, Guerrero, Mexico, in British Museum (Natural History), examined. F.O.P.-Cambridge, 1902, *op. cit.,* 2:348, pl. 32, figs. 34, 34a, ♀.

Discussion. In addition to the holotype, two other specimens were designated as "paratypes" in the British Museum collection. The epigyna of these two specimens are distinct from those of the holotype and after careful measurements of the carapace, eye rows, and legs, the specimens were placed in *H. schmidti.* They agree closely with *H. schmidti* in body size, eye arrangement, and leg length in addition to epigynal structure. *Hamataliwa subfacilis* has a uniquely shaped epigynum (Fig. 92) and it was first thought to be plugged by a tough matrix as it was in other specimens examined, but probing with a needle revealed the sclerotized region to be continuous. Therefore, the epigynum figured is a true representation as it appears in the holotype. It is still possible that the scalloped ventral rim may prove to be abnormal. Specimens having comparable bodily dimensions and agreeing in eye arrangement should be carefully checked against measurements of the holotype.

Measurements. Length of female holotype 8.0 mm, carapace width 2.9 mm, carapace length 3.6 mm.

Width of eye rows: AME .35 mm, ALE 1.10 mm, PLE 2.05 mm, PME 1.50 mm.

Segments of leg I: femur 3.5 mm, patella-tibia 4.4 mm, metatarsus 2.5 mm, tarsus 1.2 mm, total length I 11.6 mm.

Length of patella-tibiae: II 4.0 mm, III 3.0 mm, IV 2.9 mm.

Color. Female. Pattern on face illustrated in Figure 45. Following is the original description by O.P.-Cambridge:

"The general colours are very much like those of *O. facile,* but the femora and the base of the tibiae are marked with a not very distinct, dark brown annulus; the general hue of the legs is brownish-yellow, that of the cephalothorax and falces yellow-brown, darker than the legs. The abdomen on the sides and upper part is, in front, of a dull luteous-yellow colour, dark brown behind towards the sides, with a central longitudinal dentated stripe of brown on the fore half, followed towards the spinners by a series of dark brown angular lines or chevrons; the underside has a broad, longitudinal, central dark brown band. The abdomen, like that of *O. facile,* appears to have been more or less covered with squamose grey and other hairs, most of which have been rubbed off."

The holotype is darker in color than it is in the above description. The face, chelicerae, and carapace are reddish brown and the abdomen is tan or beige in color. This color change may be the result of many years in preservative.

Diagnosis. Hamataliwa subfacilis is similar to *H. schmidti* in body size, eye ar-

rangement, and leg length. However, the ratio of AME width to ALE width is different (see measurements) in the two species and the eyes seem to occupy a proportionally larger area of the carapace in *H. schmidti* than they do in *H. subfacilis*. In addition the epigynum of *H. subfacilis* is unique in shape (compare Fig. 92 with Figs. 89–91).

Distribution. Mexico (Map 3).

Records. MEXICO. *Guerrero.* Amula, 9.5 km NW of Chilapa, ♀ (H. H. Smith).

Hamataliwa schmidti Reimoser

Figures 46, 47, 89–91. Map 3.

Hamataliwa schmidti Reimoser, 1939, Ann. Natur. Mus. Wein, 50:342–343, fig. 5, ♀. Two female syntypes from San José, Costa Rica, in Natural History Museum, Vienna, examined.

Measurements. Length of nine females 6.2–9.2 mm, mean 7.84 mm; carapace width 2.4–2.9 mm, mean 2.65 mm; carapace length 2.7–3.6 mm, mean 3.05 mm.

Width of eye rows: AME .30–.40 mm, mean .347 mm; ALE 1.03–1.45 mm, mean 1.233 mm; PLE 1.80–2.43 mm, mean 2.114 mm; PME 1.38–1.93 mm, mean 1.619 mm.

Segments of leg I: femur 2.4–3.7 mm, mean 3.16 mm; patella-tibia 3.8–5.0 mm, mean 4.17 mm; metatarsus 2.1–2.7 mm, mean 2.33 mm; tarsus 1.0–1.4 mm, mean 1.11 mm; total length I 9.8–12.7 mm, mean 10.77 mm.

Length of patella-tibiae: II 3.3–4.5 mm, mean 3.75 mm; III 2.5–3.3 mm, mean 2.75 mm; IV 2.4–3.2 mm, mean 2.64 mm.

Color. Female. Pattern illustrated in Figures 46 and 47.

Face and chelicerae yellow-orange to reddish brown, lighter yellowish along lower edge of clypeus. Long white hair along lateral margins of face and over front of chelicerae.

Carapace yellow-orange to reddish brown, covered with intermixture of white and dark brown hair.

Dorsum of abdomen pale yellow to cream ground color with irregular pattern of bands and spots formed by brown and white spatulate-shaped, appressed hairs that impart an over-all light brown or gray appearance. Cardiac area often darkly accented as in specimen figured. Venter of abdomen with broad median brown stripe from epigastric furrow to base of spinnerets. The stripe outlined by thinner areas of white laterally.

Legs yellow to yellow-orange, fringed with long white hair along prolateral and retrolateral margins.

Labium and endites pale yellow to light yellow-orange, distal ends ivory. Sternum ivory to pale yellow.

Diagnosis. The specimens classified as *H. schmidti* show considerable diversity in size. They all agree in the structure of the epigynum, eye arrangement, and body proportions. This species is of relatively wide occurrence in the Mexican and Central American region and the size differences may be simply a reflection of the geographic variability of widely separated specimens. There is less likelihood, I think, that more than one species is represented in this assortment. Additional specimens and particularly males associated with females should clarify the picture.

Hamataliwa schmidti resembles *H. subfacilis* in body size, eye arrangement, and leg length, but the epigyna of these two species are quite distinct (compare Figs. 89, 91 with Fig. 92). The shape of the epigynum in *H. positiva* is similar to that of *H. schmidti*, but the genitalia of the latter are much larger in size (compare Figs. 89–91 with Fig. 93).

Hamataliwa schmidti resembles *H. grisea* and *H. facilis* in size and general appearance, and there are similarities in eye arrangement and the structure of the genitalia in these three species. The three species can be separated by measurements of the eye rows and genitalic characteristics (compare Figs. 89–91 with Figs. 94–98 of this paper and figs. 115, 116 of Brady, 1964).

Distribution. Mexico to Costa Rica (Map 3).

Records. MEXICO. *San Luis Potosí.* Tamazunchale, 20 May 1952, ♀ (Cazier, Gertsch, Schrammel). *Jalisco.* ♀. *Oaxaca.* Tolosa, 1–12 Apr. 1947, ♀ (B. Malkin).

GUATEMALA. ♀♀ (F. Sargent) Capetillo, 20–23 Aug. 1947, ♀, San Jeronimo, 24–26 July 1947, ♀ (C., P. Vaurie).

COSTA RICA. La Caja near San José, 1932, 3♀♀ (E. Schmidt).

Hamataliwa grisea Keyserling

Hamataliwa grisea Keyserling, 1887, Verh. Zool. -Bot. Wien, 37:458, pl. 6, fig. 24, ♀. Female holotype from North America, in the British Museum (Natural History), examined.

Hamataliwa grisea: Simon, 1898, Histoire naturelle des Araignées, 2(2):375, 377, 378, 380, figs. 373, 379. Comstock, 1912, The Spider Book, p. 660; *op. cit.*, rev. ed., 1940, p. 668.

Hamataliwa grisea is the most common species of this genus found in North America. Its range extends from the southern United States southward into Guanajuato and Jalisco (see map 5 of Brady, 1964).

Of the species considered in this paper, *H. grisea* is closest to *H. schmidti* and *H. facilis* in size and general morphology. *Hamataliwa grisea* is differentiated from both of these species by eye arrangement (compare measurements) and the structure of the genitalia (compare figs. 115, 116 of Brady, 1964, with Figs. 89–91, 94, 95 of this paper). For a discussion of the natural history of this species see Brady, 1964, p. 503.

Hamataliwa circularis (Kraus)

Figures 37, 38, 99, 100. Map 3.

Oxyopeidon circularis Kraus, 1955, Abh. Senckenb. Naturf. Ges., 493:39, pl. 5, fig. 98, ♀. Female holotype from 6 km N of Los Blancos, El Salvador, in Senckenberg Museum, examined.

Measurements. Length of female holotype 6.3 mm, carapace width 1.8 mm, carapace length 2.1 mm.

Width of eye rows: AME .27 mm, ALE .72 mm, PLE 1.29 mm, PME 1.00 mm.

Segments of leg 1: femur 1.9 mm, patella-tibia 2.3 mm, metatarsus 1.5 mm, tarsus 0.7 mm, total length I 6.4 mm.

Length of patella-tibiae: II 2.1 mm, III 1.9 mm, IV 1.8 mm.

Color. Female. Pattern illustrated in Figures 37 and 38. Face and chelicerae yellow-orange overlaid with gray. Lower edge of clypeus and distal ends of chelicerae yellowish.

Carapace yellow-orange overlaid with gray, giving this region a darker orange or reddish brown appearance.

Dorsum of abdomen pale yellow or cream colored with gray overtones. Venter of abdomen cream with longitudinal black inclusions beneath integument.

Legs yellow with distal segments light orange-brown.

Labium, endites, and sternum cream.

Diagnosis. The eye arrangement of this species is reminiscent of certain species of *Oxyopes*, but the relative length of the legs (I-II-III-IV) and the epigynum are characteristic of *Hamataliwa*.

Hamataliwa circularis is closest to members of the *puta* species group in having the PME row wider than the ALE row. However, the epigynum of *H. circularis* is distinct, with the seminal receptacles widely separated (Figs. 99, 100); this feature was not found in any of the other species of *Hamataliwa* in this investigation. The structure of the male palpus will determine whether or not this species should be placed in the *puta* group.

Distribution. El Salvador (Map 3).

Records. EL SALVADOR. Forest 6 km N. of Los Blancos, 24 Apr. 1951, ♂ San Salvador, Tropical Institute, 700 m, 30 Apr. 1950, ♀, Sept. 1951, ♀ (A. Zilch).

Hamataliwa bufo sp. n.

Figures 48, 49, 101–103. Map 3.

Holotype. Female from Barro Colorado Island, Panama Canal Zone, 1–4 July 1950 (A. M. Chickering), in Museum of Comparative Zoology.

Measurements. Length of four females 6.1–7.7 mm, carapace width 2.4–2.6 mm, carapace length 2.9–3.2 mm.

Width of eye rows: AME .32–.33 mm, ALE .84–.90 mm, PLE 1.59–1.69, PME .95–1.04 mm.

Segments of leg I: femur 2.4–2.6 mm, patella-tibia 2.9–3.2 mm, metatarsus 1.9–2.0 mm, tarsus 1.0 mm, total length I 8.3–8.8 mm.

Patella-tibiae: II 2.8–3.1 mm, III 2.1–2.3 mm, IV 2.0–2.2 mm.

Color. Pattern illustrated in Figures 48 and 49. Face and chelicerae brown with heavy clothing of white, appressed hair, lower edge of clypeus protuberant, yellowish. Tufts of white hair above PLE and prominent tufts at dorsum of carapace between PME (see Fig. 48).

Carapace brown with thick clothing of intermixed white and dark brown hair forming an irregular pattern. Heavy fringes of white hair along lower edge of cephalothorax in one specimen.

Dorsum of abdomen mottled gray in appearance due to mixture of white and black hair. Venter with median area gray-brown from epigastric furrow to spinnerets, outlined in pale yellow or cream. Pale yellow or cream anterior to epigastric furrow.

Legs yellow-brown to brown with ventral surface lighter yellowish.

Labium and endites yellow to brownish yellow with distal ends ivory. Sternum yellow.

Diagnosis. Hamataliwa bufo is readily distinguished from other species of *Hamataliwa* by its extremely high cephalothorax, and its squat, robust short-legged appearance. In addition the clypeus is very high and protuberant along its lower edge, with the anterior face of the chelicerae flat and not rounded as in other species of the genus.

Distribution. Panama (Map 3).

Records. PANAMA. *Canal Zone.* Barro Colorado Island, 3–5 July 1936, ♀, 1–4 July 1950, ♀; Chilibre, 8 July 1950, ♀; Fort Sherman 14–16 Aug. 1939, ♀ (A. M. Chickering).

MAP 4

Hamataliwa tricuspidata (F.O.P.-Cambridge)

Figures 50–53, 104–106, 128, 129. Map 4.

Oxyopes tricuspidatus F.O.P.-Cambridge, 1902, Biologia Centrali-Americana, Arachnida, Araneidea, 2:343, pl. 32, figs. 17, 17a–17b, ♂. Male holotype from Bugaba, Panama, in British Museum (Natural History), examined.

Oxyopes clypeatus F.O.P.-Cambridge, 1902, Biologia Centrali-Americana, Arachnida, Araneidea, 2:345, pl. 32, fig. 26, ♀. Female holotype from Bugaba, Panama, in British Museum (Natural History), examined. NEW SYNONYMY.

Measurements. Length of eight males 5.0–5.8 mm, mean 5.34 mm; carapace width 1.9–2.2 mm, mean 1.99 mm; carapace length 2.3–2.6 mm, mean 2.43 mm.

Width of eye rows: AME .28–.30 mm, mean 2.94 mm; ALE .58–.68 mm, mean .628 mm; PLE 1.05–1.15 mm, mean 1.106 mm; PME .58–.63 mm, mean .600 mm.

Segments of leg I: femur 2.3–2.7 mm, mean 2.48 mm; patella-tibia 2.9–3.4 mm, mean 3.04 mm; metatarsus 2.0–2.5 mm, mean 2.27 mm; tarsus .9–1.1 mm, mean .98 mm; total length I 8.2–9.6 mm, mean 8.78 mm.

Patella-tibiae: II 2.6–3.2 mm, mean 2.84 mm; III 2.0–2.4 mm, mean 2.11 mm; IV 2.0–2.4 mm, mean 2.11 mm.

Length of eight females 6.3–8.8 mm, mean 7.39 mm; carapace width 2.2–2.5 mm, mean 2.34 mm; carapace length 2.7–3.3 mm, mean 3.01 mm.

Width of eye rows: AME .33–.38 mm, mean .341 mm; ALE .73–.75 mm, mean .731 mm; PLE 1.28–1.43 mm, mean 1.319 mm; PME .68–.73 mm, mean .706 mm.

Segments of leg I: femur 2.5–3.0 mm, mean 2.78 mm; patella-tibia 3.0–3.7 mm, mean 3.28 mm; metatarsus 2.1–2.6 mm, mean 2.34 mm; tarsus .9–1.1 mm, mean 1.03 mm; total length I 8.6–10.3 mm, mean 9.42 mm.

Patella-tibiae: II 2.8–3.5 mm, mean 3.13 mm; III 2.0–2.7 mm, mean 2.37 mm; IV 2.1–2.8 mm, mean 2.44 mm.

Color. Male. Pattern illustrated in Figures 52 and 53. Face pale yellow to yellow-orange, darker vertical stripes from ALE to edge of clypeus. Median area of lower edge of clypeus cream.

Carapace yellow-orange, darker brownish along vertical sides. Light scale-like hairs contribute iridescent sheen, predominant laterally and at posterior declivity.

Dorsum of abdomen cream to brownish yellow, with dark brown indentations about one-third distance from spinnerets to base, accented by white spots. Sides of abdomen brown. Median area of venter brown, enclosed by narrow yellow stripes laterally.

Legs yellow-orange. Darker, brownish on ventral surface of femora. Legs covered with appressed spatulate hairs that give iridescent sheen.

Labium and endites yellow to yellow-orange with distal ends ivory. Sternum yellow.

Cymbia of palpi black.

Color. Female. Pattern illustrated in Figures 50 and 51. Face pale yellow to orange-yellow with darker, yellow-brown stripes from ALE to lower edge of clypeus and continuing to distal end of chelicerae. Median area of clypeus cream colored.

Carapace pale orange-yellow. Sides with brown spatulate hairs.

Dorsum of abdomen cream to pale yellow. Dark brown indentations one-third distance from spinnerets to base. Venter cream colored with faint brownish median stripe.

Legs yellow with scattered dusky hairs. Ventral surface of femora brownish yellow.

Labium, endites, and sternum yellow. Endites often with brownish overtones.

Diagnosis. Hamataliwa tricuspidata is very different from other species of *Hamataliwa* considered in this paper. The color pattern, eye arrangement, and long tapering abdomen are reminiscent of some species of *Oxyopes*. However, the relative length of the legs and genitalic characteristics place it close to *Hamataliwa*.

Although the order of leg length in this species is I-II-IV-III (with I longest), patella-tibia IV is only slightly longer than patella-tibia III. In this respect *H. tricuspidata* is closest to *Hamataliwa* since in *Oxyopes* species examined, patella-tibia IV is much longer than patella-tibia III as shown in Table II, page 493 (Brady, 1964). Correlated with this is the fact that leg IV in *Oxyopes* species is much more developed than it is in *Hamataliwa* species, and this development is related to the habits of these spiders.

At this stage it would appear that *H. tricuspidata* is intermediate between *Oxyopes* and *Hamataliwa*, having some characters in common with the former and others with the latter.

The female genitalia (Figs. 104–106) and the male palpus (Figs. 128, 129) of *H. tricuspidata* resemble those of other species of *Hamataliwa* and that resemblance is considered the most important factor here. An alternative to placing *H. tricuspidata* in *Hamataliwa* would be to establish a new genus for this species, but until much more is known of the Neotropical oxyopids the more conservative path seems the best.

Distribution. Costa Rica, Panama, and southeastward to British Guiana (Map 4).

Records. COSTA RICA. San José, ♂♀ (N. Banks).

PANAMA. ♀♀ (N. Banks). Arraiján, 6–9 July 1950, ♂♂♀o (A. M. Chickering). Bugaba (Chiriquí, 22 km NW of David), ♀♀ (G. C. Champion). *Canal Zone.* Barro Colorado Island, 16 June–15 July 1935, ♀;

Madden Dam, 27 July 1954, ♂. Chilibre, 8 July 1950, ♂ (A. M. Chickering).

BRITISH GUIANA. Kaieteur, 29 July–7 Aug. 1911, 3♂♂:3♀♀:7oo (F. E. Lutz).

REFERENCES CITED

Banks, N. 1898. Arachnida from Baja California, and other parts of Mexico. Proc. California Acad. Sci., **1**(7):205–308.

Brady, A. R. 1964. The lynx spiders of North America, north of Mexico (Araneae: Oxyopidae). Bull. Mus. Comp. Zool., **131**: 429–518.

Chamberlin, R. V. 1924. The spider fauna of the shores and islands of the Gulf of California. Proc. California Acad. Sci., **12**:561–694.

———. 1929. Three new spiders of the genus *Oxyopes* (Araneina). Ent. News, **40**:17–20.

Chamberlin, R. V., and W. Ivie. 1936. New spiders from Mexico and Panama. Bull. Univ. Utah, **27**(5):1–103.

Chrysanthus, Fr. 1967. Spiders from south New Guinea VIII. Nova Guinea, Zoology, **37**:401–426.

Comstock, J. H. 1913. The Spider Book. Garden City, New York, 1–721.

Keyserling, E. 1887. Neue Spinnen aus Amerika. VII. Verh. Zool.-Bot. Ges. Wien, **37**:421–490.

Kraus, O. 1955. Spinnen aus El Salvador (Arachnoidea, Araneae). Abh. Senkenb. Naturf. Ges., **493**:1–112.

Mello-Leitão, C. 1928. Novas notas arachnologicas. Bol. Mus. Rio de Janeiro, **4**(3): 49–54.

Pickard-Cambridge, F. O. 1902. Biologia Centrali-Americana, Arachnida, Araneidea and Opilones. London, **2**:313–424.

Pickard-Cambridge, O. 1894. Biologia Centrali-Americana, Arachnida, Araneidea. London, **1**:121–144.

Reimoser, E. 1939. Die Spinnenfauna, *In* Wiss. Erg. Oesterr. Biol. Exped. nach Costa Rica. Ann. Naturh. Mus. Wien, **50**:327–386.

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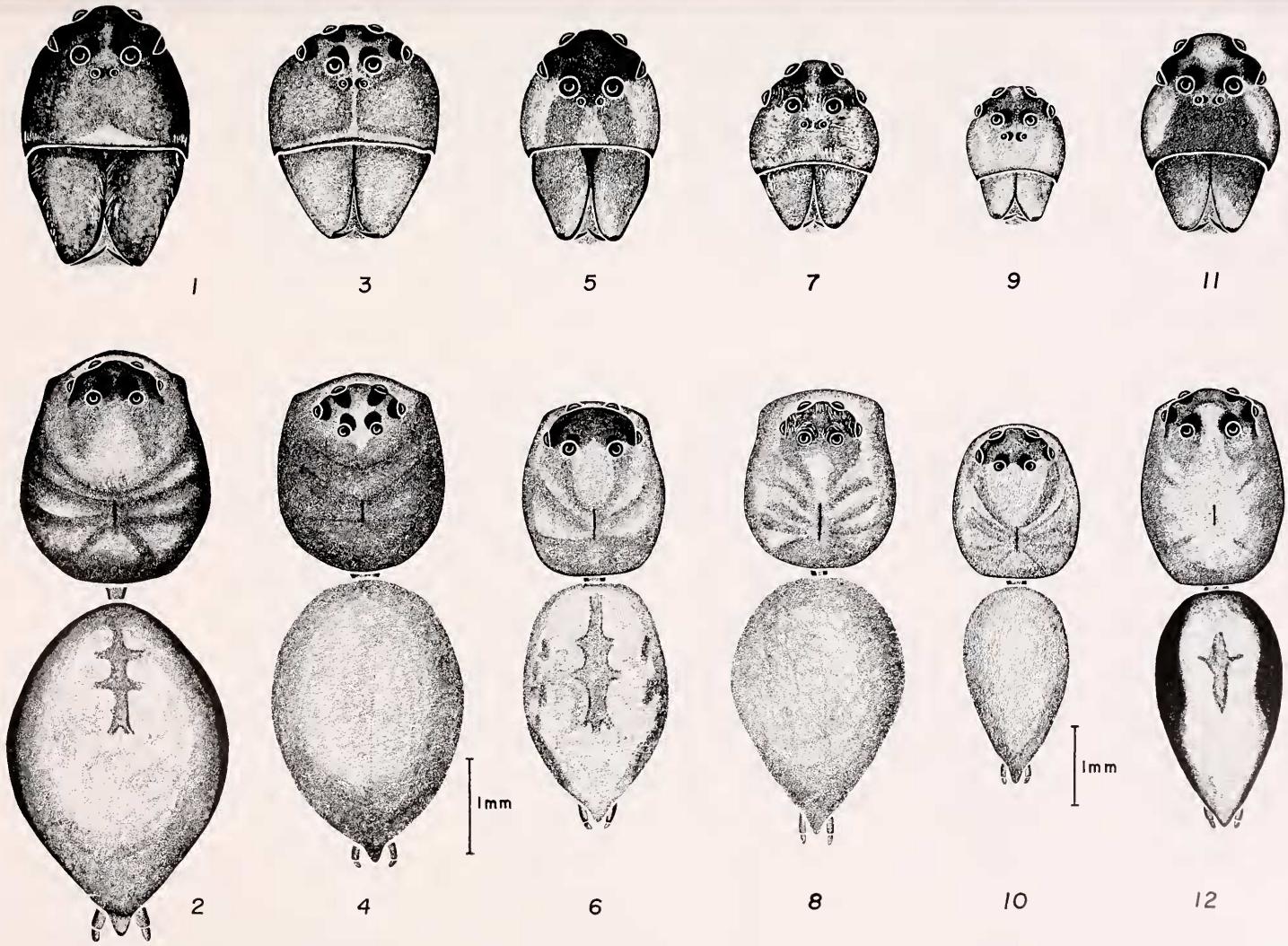
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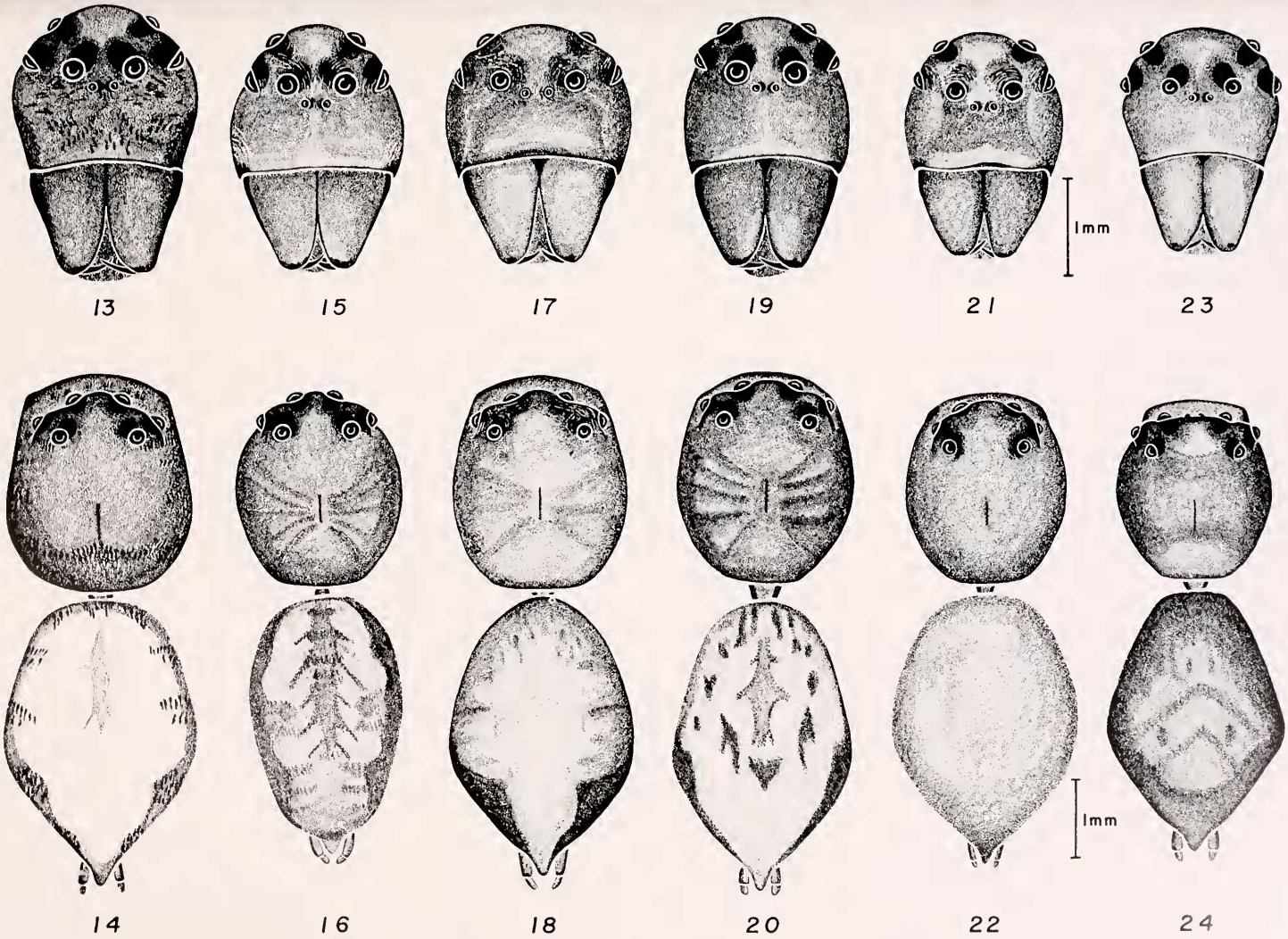
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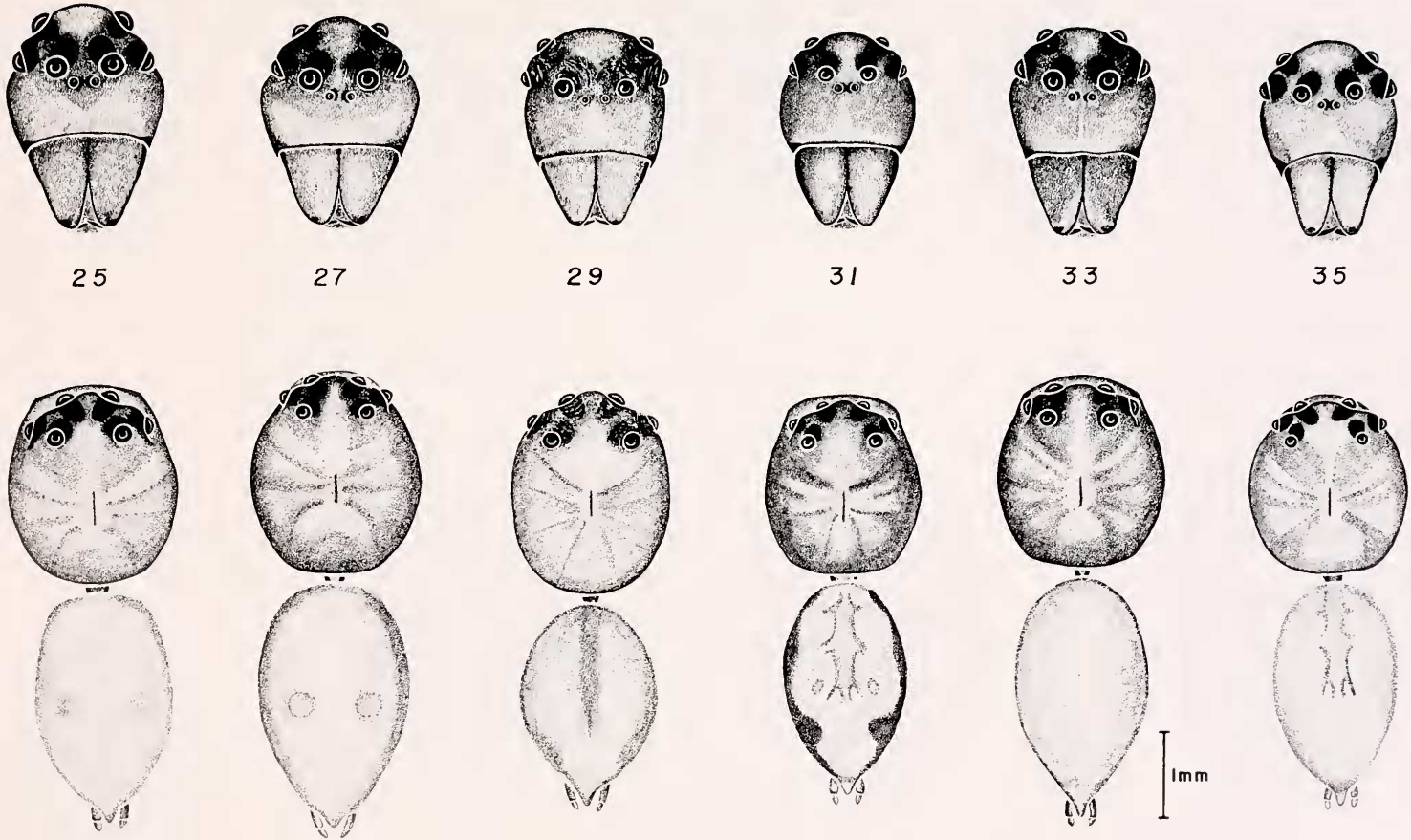
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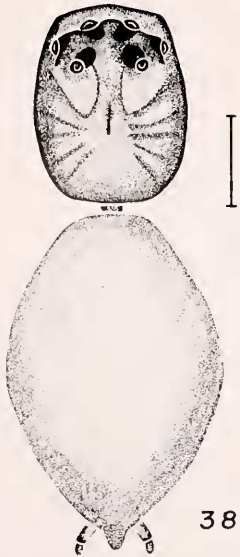

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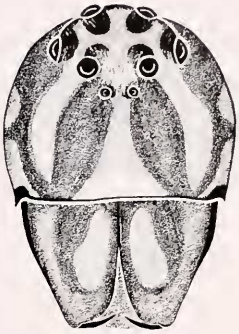

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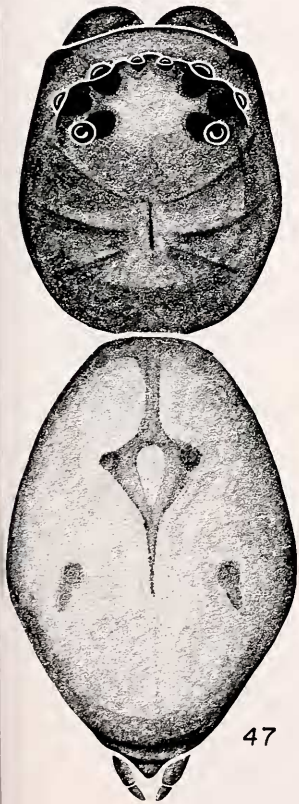

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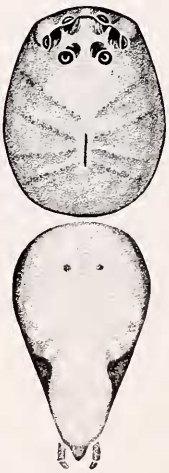

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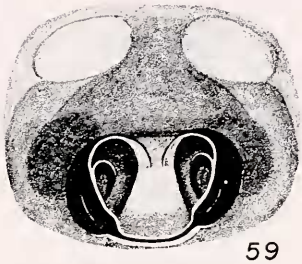

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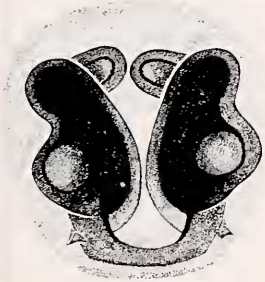

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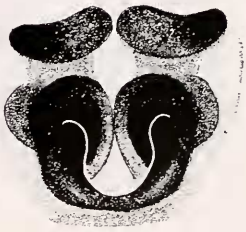

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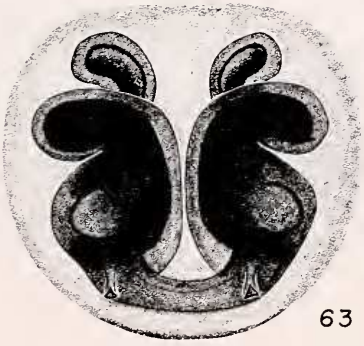

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Figs. 65–67. *Hamataliwa puta* (O.P.-Cambridge), female paratypes from Bugaba, Panama. 65. Internal genitalia. 66. Epigynum. 67. Epigynum of "allotype."

Figs. 68–69. *Hamataliwa ursa* sp. n., female from Barro Colorado Island, Panama Canal Zone, 1–4 July 1950. 68. Internal genitalia. 69. Epigynum.

Figs. 70–72. *Hamataliwa flebilis* (O.P.-Cambridge), female paratypes from Bugaba, Panama. 70. Epigynum of "allotype." 71. Epigynum. 72. Internal genitalia.

Figs. 73–74. *Hamataliwa cavata* (Kraus), female allotype from San Salvador, El Salvador, 30 Apr. 1951, epigynum mounted in glycerine gel. 73. Dorsal view. 74. Ventral view.

Figs. 75–76. *Hamataliwa hista* sp. n., female from Boquete, Panama, 4–11 Aug. 1954. 75. Internal genitalia. 76. Epigynum.

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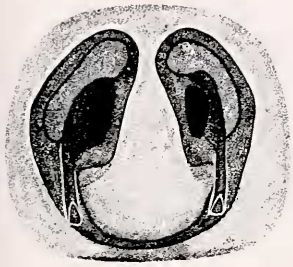

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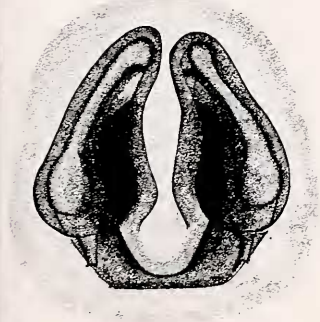

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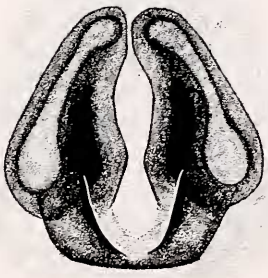

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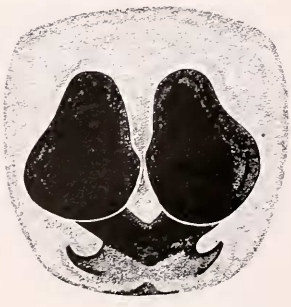

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Figs. 77–78. *Hamataliwa cracata* sp. n., female from Summit, Panama Canal Zone, 21–29 July 1950. 77. Internal genitalia. 78. Epigynum.

Figs. 79–80. *Hamataliwa laeta* (O.P.-Cambridge), female holotype from Das Caminos, Guerrera. 79. Epigynum, drawn Mar. 1968. 80. Epigynum, drawn June 1963.

Figs. 81–82. *Hamataliwa triangularis* (Kraus), female from Barro Colorado Island, Panama Canal Zone, 23–30 June 1939. 81. Internal genitalia. 82. Epigynum.

Fig. 83. *Hamataliwa triangularis* (Kraus), epigynum of female holotype from San Salvador, El Salvador, 21 June 1961, mounted in glycerine gel.

Fig. 84. *Oxyopes globosus* F.O.P.-Cambridge = *Hamataliwa triangularis* (Kraus), epigynum of female paratype from Bugaba, Panama.

Figs. 85–88. *Hamataliwa difficilis* (O.P.-Cambridge), females from Amula, Guerrera. 85. Epigynum of lectotype. 86. Internal genitalia of paralectotype. 87. Epigynum of paralectotype. 88. Epigynum of holotype of *Oxyopeidan malestum* O.P.-Cambridge = *Hamataliwa difficilis*.

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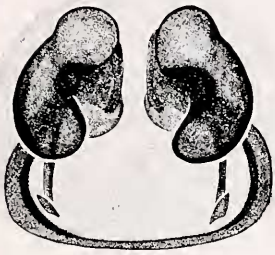

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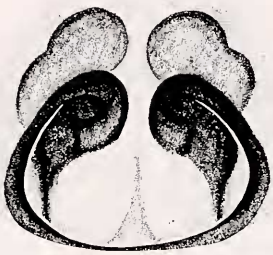

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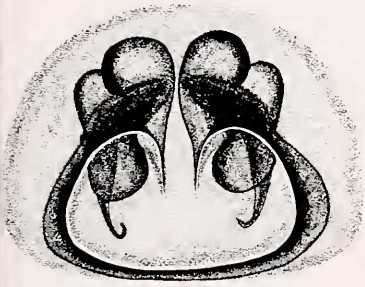

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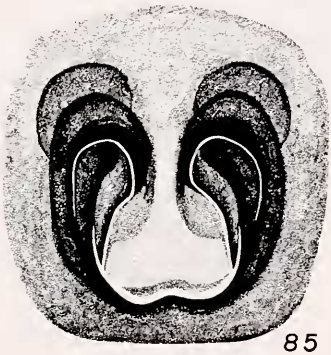

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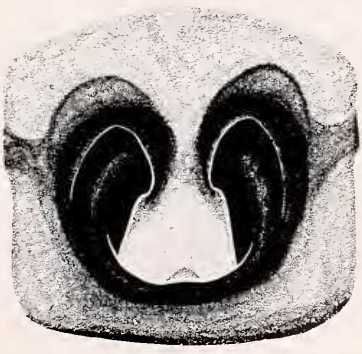

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Fig. 89. *Homotoliwa schmidti* Reimoser, epigynum of female from Guatemala.

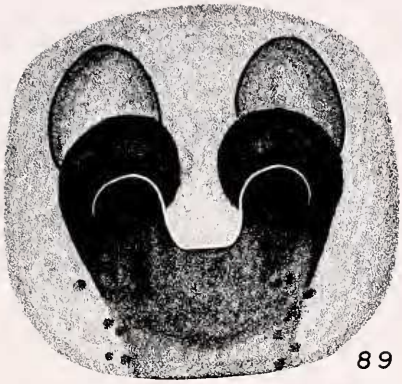
Figs. 90–91. *Homotoliwa schmidti* Reimoser, female syntype from San José, Costa Rica. 90. Internal genitalia. 91. Epigynum.

Fig. 92. *Homataliwa subfacilis* (O.P.-Cambridge), epigynum of female holotype from Amula, Guerrero.

Fig. 93. *Homotoliwa positiva* Chamberlin, epigynum of female holotype from San Carlos Bay, Sonora, 7 July 1921.

Figs. 94–95. *Homataliwa facilis* (O.P.-Cambridge), female holotype from Chilpancingo, Guerrero. 94. Epigynum drawn April 1968. 95. Epigynum drawn June 1963.

Figs. 96–98. *Hamotoliwa facilis* (O.P.-Cambridge), female paratypes from Chilpancingo, Guerrero. 96. Internal genitalia. 97. Epigynum. 98. Epigynum.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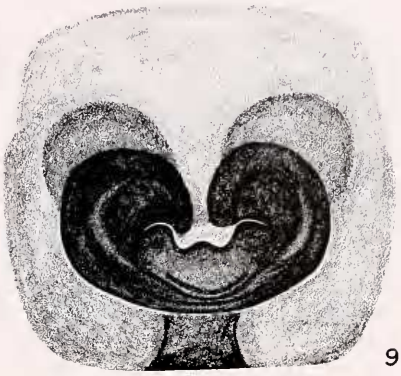
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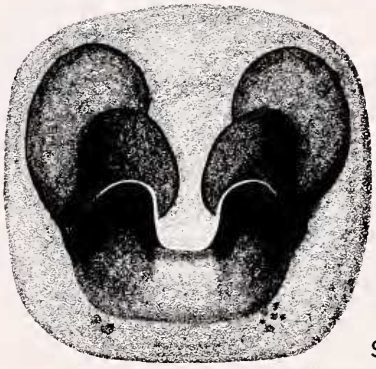
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Figs. 99–100. *Hamataliwa circularis* (Kraus), female holotype from 6 km N of Las Blancos, El Salvador, genitalia mounted in glycerine gel. 99. Ventral view. 100. Dorsal view.

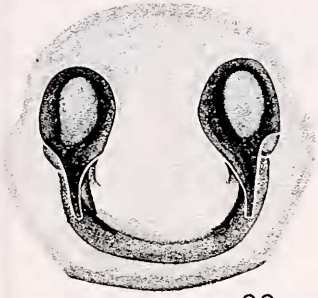
Figs. 101–102. *Hamataliwa bufo* sp. n., female from Barro Colorado Island, Panama Canal Zone, 3–5 July 1936. 101. Internal genitalia. 102. Epigynum.

Fig. 103. *Hamataliwa bufo* sp. n., epigynum of female holotype from Barro Colorado Island, Panama Canal Zone, 1–4 July 1950.

Fig. 104. *Hamataliwa tricuspidata* (F.O.P.-Cambridge), internal genitalia of female from Arraijan, Panama, 6–9 July 1950.

Fig. 105. *Oxyopes clypeatus* F.O.P.-Cambridge = *Hamataliwa tricuspidatus*, epigynum of female holotype from Bugaba, Panama.

Fig. 106. *Hamataliwa tricuspidatus* (F.O.P.-Cambridge), epigynum of female from Arraijan, Panama, 6–9 July 1950.



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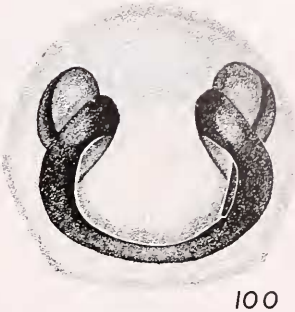

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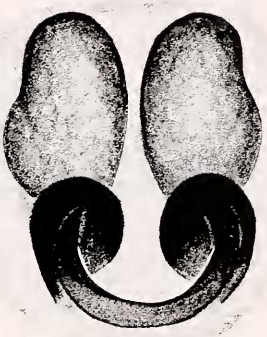

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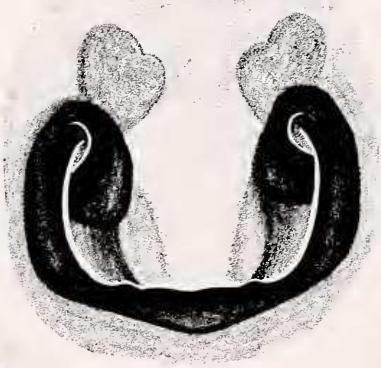

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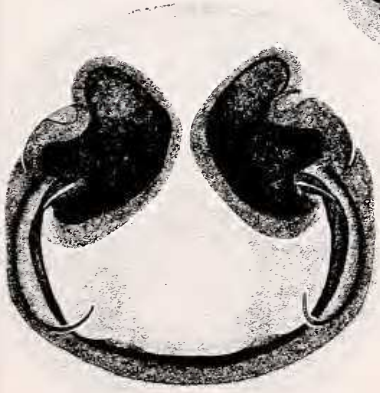

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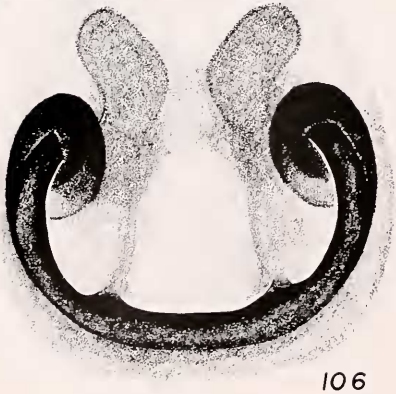

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Figs. 107–108. *Hamataliwa hista* sp. n., male holotype from Boquete, Panama, 4–11 Aug. 1954. 107. Left palpus, ventral view. 108. Left palpus, retralateral view.

Figs. 109–110. *Hamataliwa cavata* (Kraus), male holotype from San Salvador, El Salvador, Nov. 1951. 109. Palpus, ventral view. 110. Palpus, retralateral view.

Figs. 111–112. *Hamataliwa ursa* sp. n., male holotype from Barro Colorado Island, Panama Canal Zone, June 1950. 111. Palpus, ventral view. 112. Palpus, retralateral view.

Figs. 113–115. *Hamataliwa puta* (O.P.-Cambridge), male lectotype from Bugaba, Panama. 113. Palpus, ventral view. 114. Tibia of palpus. 115. Palpus, retralateral view.

Figs. 116–119. *Hamataliwa puta* (O.P.-Cambridge), poralectotypes from Bugaba, Panama. 116. Palpus, ventral view. 117. Tibia of palpus. 118. Palpus, retralateral view. 119. Tibia of palpus, second paralectotype. Figures 114, 117, 119 demonstrate variability in tibial apophyses of palpi.

Scale is for *all* palpi.

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Figs. 120–121. *Hamataliwa triangularis* (Kraus), male from Barro Colorado Island, 23–30 June 1939. 120. Left palpus, ventral view. 121. Left palpus, retrolateral view.

Figs. 122–123. *Hamataliwa globosa* (F.O.P.-Cambridge), male holotype from Bugaba, Panama. 122. Palpus, ventral view. 123. Palpus, retrolateral view.

Figs. 124–125. *Hamataliwa flebilis* (O.P.-Cambridge), male holotype from Bugaba, Panama. 124. Palpus, ventral view. 125. Palpus, retrolateral view.

Figs. 126–127. *Hamataliwa crocata* sp. n., male holotype from Summit, Panama Canal Zone, 23–28 Aug. 1950. 126. Palpus, ventral view. 127. Palpus, retrolateral view.

Figs. 128–129. *Hamataliwa tricuspidata* (F.O.P.-Cambridge), male holotype from Bugaba, Panama. 128. Palpus, ventral view. 129. Palpus, retrolateral view.

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